WESTERN GAS

ecember
1931

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SIMPLICITY . . . .

THERMOLATOR
MODEL "FS"

THERMOLATOR

OVEN HEAT CONTROL . .

Model "FS"—especially adapted for small, compact types of table top ranges . . . where the manifold arrangement does not allow sufficient space to mount the dial on the front of the range.

● WRITE FOR LITERATURE ●

MILWAUKEE GAS SPECIALTY CO.
MILWAUKEE

PERIODICAL DEC

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

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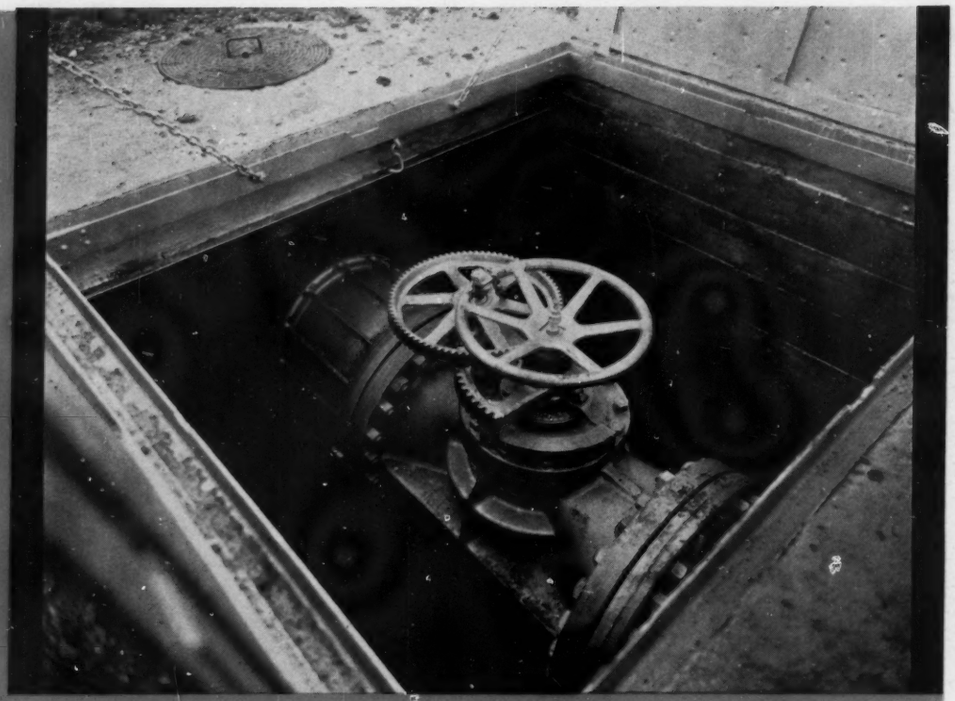

Nordstrom standard "Venturi" semi-steel, worm gear operated valves used on a Pennsylvania gas line. 24" inlet and 30" outlet line.

Now—the large size plug-cock valve —for oil and gas transmission

Before the advent of the Nordstrom Valve, practical use of plug cocks was limited to very small sizes because of their tendency to leak and stick. The Nordstrom method of pressure lubrication now makes feasible the production of plug cocks in large sizes—now being manufactured as large as 30". This offers a welcome solution. Nordstrom "Sealdport" lubrication assures a tight valve. The plug is never separated from its seat. There is no space in which foreign matter can lodge. A quarter turn completely opens or closes the valve. High pressures can be handled efficiently with no fear of leaks.

New Catalog No. 8 is now ready.

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Canada - Peacock Bros., Ltd., Montreal, Toronto, Winnipeg, Vancouver. (Also Sydney, N.S.)
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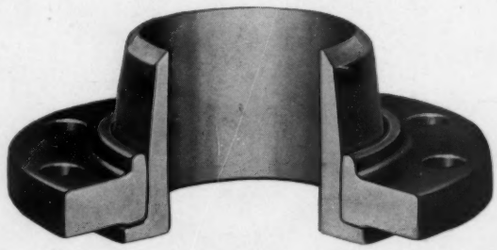
THE PERFECT APPLICATION OF A PRINCIPLE



—and for welded pipe use "Merco" Swivel Flanges

Nordstrom Valves

FLUOR *Announces* the Improved Air-Cooled Muffler

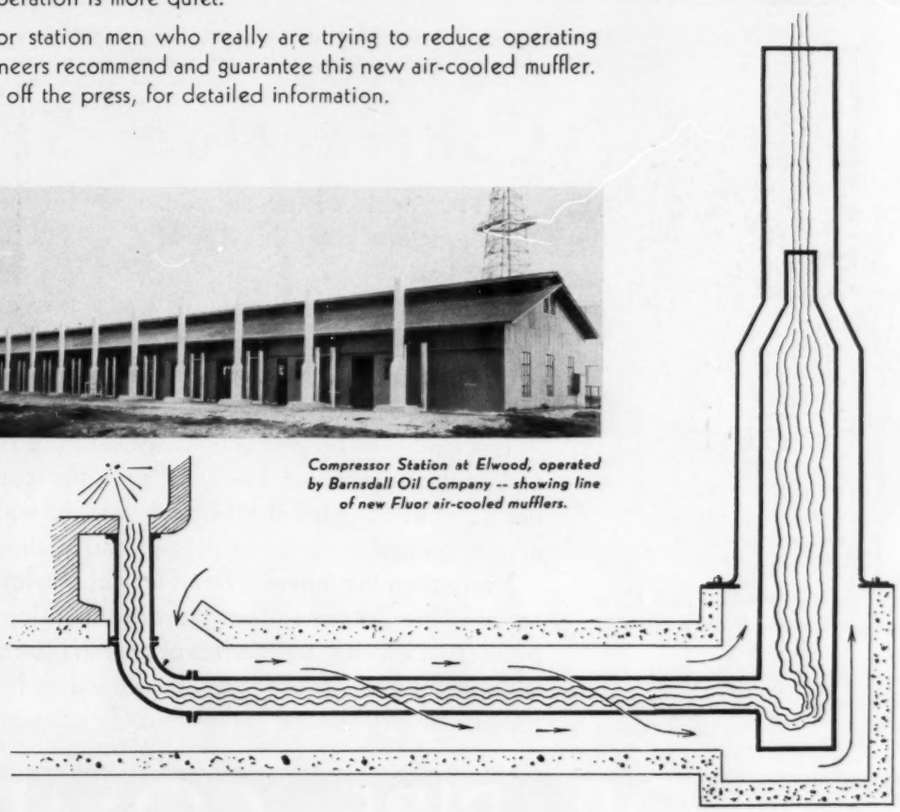
. . . It increases plant economy. It increases the working efficiencies of compressor stations. The reasons are here, for every builder, owner, or operator of compressor stations to check.

. . . The accomplishments and features of the Fluor improved air-cooled muffler are interesting. 1. No water is required. 2. No scaling or breaking of pipe is experienced. 3. Stack temperature is cooler; stack paint lasts longer. 4. No liquid spray corrodes adjacent buildings. 5. Expansion coupling eliminated. 6. There is consistently low back pressure. 7. Greater engine efficiency is afforded. 8. Engine foundation remains cooler. 9. Better engine room ventilation. 10. Operation is more quiet.

. . . For compressor station men who really are trying to reduce operating expense, Fluor engineers recommend and guarantee this new air-cooled muffler. Request folder, just off the press, for detailed information.

The outer stack.

Compressor Station at Elwood, operated by Barnsdall Oil Company -- showing line of new Fluor air-cooled mufflers.



Diagrammatic sketch shows sectional view (not to scale). . . . Arrows indicates air flow which completely envelops the line.

THE Fluor CORPORATION, LTD.

909 East 59th Street ◆ Los Angeles, Calif.

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NEW YORK, N. Y. 30 CHURCH STREET

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KANSAS CITY, MO. 503 FAIRFAX BLDG.

December, 1931, Volume VII, Number 12, Western Gas is published by Western Business Papers, Inc., at 124 West Fourth Street, Los Angeles, California. Subscription price (in advance) 20 cents the copy; $2.00 per year; 2 years, $3.00; $3.00 per year foreign. Entered as second class matter June 1, 1925, at the postoffice at Los Angeles, under the Act of March 3, 1879.

Installation of 16-inch Naylor SPIRAL-WELD Pipe, 30- foot lengths—Desert Country, Pecos, Texas.

Absorbs Expansion and Contraction Strains..

THE "heel" of the distinctive Naylor spiral lock-seam truss structure gives Naylor SPIRALWELD Pipe an *inherent flexibility*.

This "heel" which, in effect, is a miniature expansion joint, runs continuously through the entire length of the pipe, providing an evenly distributed cushion which absorbs expansion and contraction stresses and strains all along the line.

The ability of Naylor SPIRALWELD Pipe to absorb expansion and contraction within itself, relieves the coupling medium and the body of the pipe itself from having to withstand the brunt of expansion and contraction stresses and strains.

Moreover, the *inherent flexibility* of Naylor SPIRALWELD Pipe removes the danger of damage from expansion and contraction—a protection which is a guarantee of greater pipe dependability. And, it's a guarantee of economy, too, because Naylor SPIRALWELD Pipe *flexibility* eliminates the need of expansion joints of any kind.

TRADE MARK
NAYLORPIPE

PIPE CARRIED IN STOCK AT CHICAGO, HOUSTON AND LOS ANGELES

Proved Naylor SPIRALWELD Pipe advantages for air, water, gas and oil lines:

Flexibility
Light Weight
Long Life
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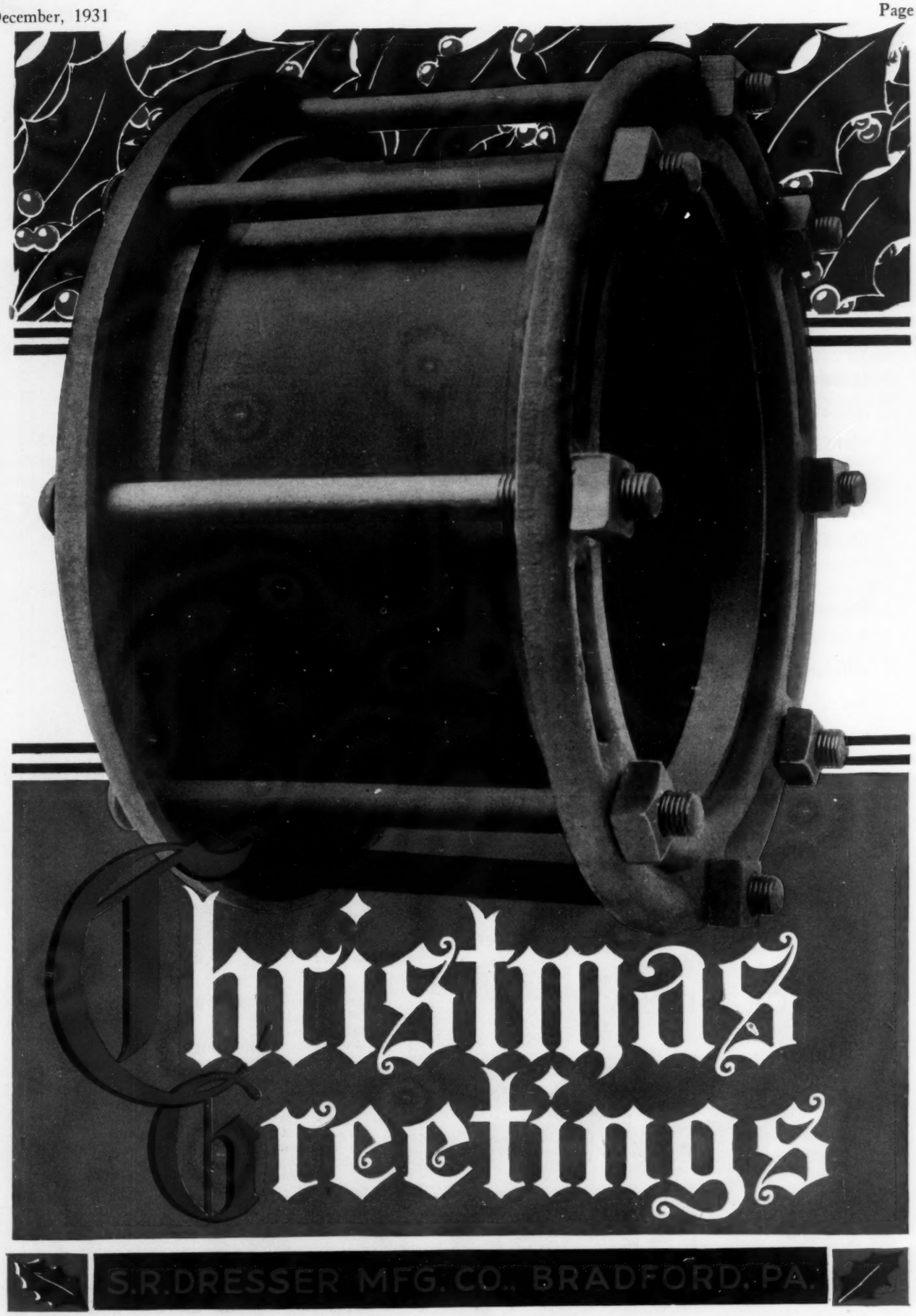
Christmas
Greetings
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FOR 50 years FISHER has specialized in the building of fluid control equipment. The accumulated experience of this half-century is reflected in the superior quality and the complete line of FISHER Specialties. While there are thousands of types and sizes of FISHER Specialties there is only one FISHER Quality.

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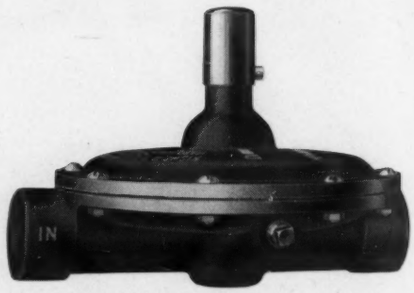
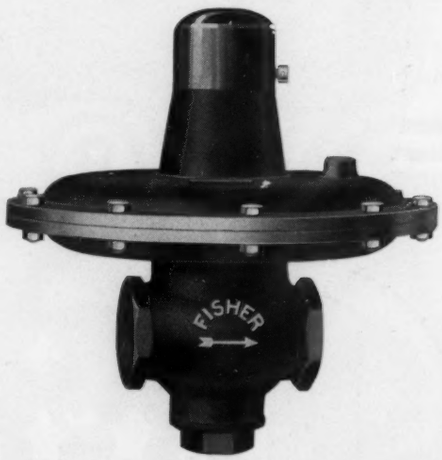


The Fisher Type 725 House Service Regulator reduces high initial gas pressures (1 to 300 lbs.) to inches of water. It has distinctive features that make it more sensitive, while its extreme simplicity and rugged construction assure trouble-free operation and long life. This is not a stock "regulator"—it is "custom built" to suit the specific operating pressures and the natural gas, manufactured gas, or propane, etc., for which it was ordered. Write for a copy of Circular No. 805.



The Fisher Type 905 Appliance Gas Regulator assures efficient and dependable operation of a great variety of industrial and domestic gas appliances because it provides a constant service pressure at the burners regardless of variations in line pressure or volume. It is simple in design, rugged in construction, extremely sensitive, easy to adjust and has a wide pressure range and a large capacity. The valve body is designed on the streamline principle (an exclusive Fisher Development) to minimize friction loss. Ask for Circular No. 825.

U. S. de Lavaud Pipe

During the past eight years, more than 10,000 miles of deLavaud Pipe have been specified by engineers and contractors in cities throughout the country.

DeLavaud Pipe is light in weight; easy to cut and tap. And tests have proved that it is at least 25% stronger than good pit cast pipe.

The deLavaud Handbook gives complete details and specifications. For free copy address: United States Pipe and Foundry Co., Burlington, N. J.

Sales offices located in the following cities: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles.

Our pipe bears the "Q-check" trademark of The Cast Iron Pipe Research Association

Illustration shows the deLavaud machine in action.

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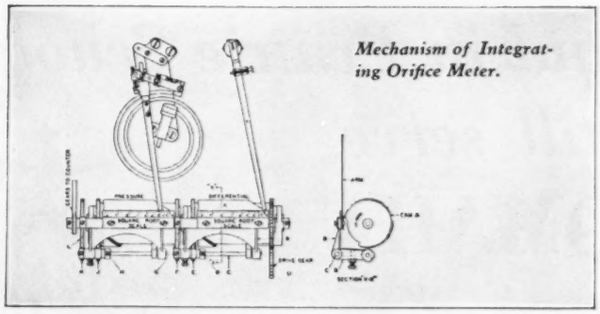
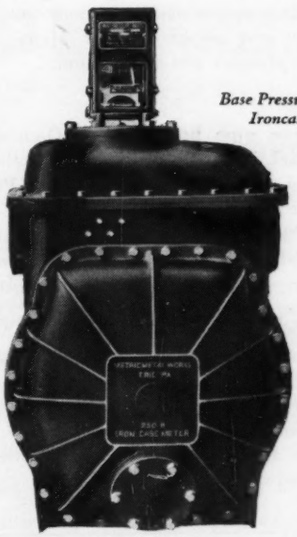


Mechanism of Integrating Orifice Meter.

Further perfected by American Meter Company

THROUGH this principle perfected by American Meter Company all integrating functions are performed mechanically by cam and special gears. Reversible motions of cams or gears are eliminated. The gear train to the index is locked when not operating. No function of the integration is affected by the power. Clutches are eliminated thus doing away with slippage.



Base Pressure Index on Ironcase Meter

Measurement at your Standard Conditions

Base Pressure Index, indicates volume, in cubic feet at standard pressure, measured by displacement meters. Bulletin E-12.

Integrating Orifice Meter, indicates volume measured by orifice meter under varying line pressure conditions. Bulletin E-16.

Integrating Flowmeter, indicates volume of liquid measured by orifice meter, or volume of gas measured by orifice meter at constant pressure. Bulletin E-16.

AMERICAN METER CO. MEASUREMENT ENGINEERS CUBIC FEET

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INCORPORATED
The World's Largest Manufacturers of Gas Meters and Allied Apparatus
ESTABLISHED 1836
GENERAL OFFICES : 105 W. 40TH STREET · NEW YORK, N.Y.

METER METRIC

CAST IRON GAS MAINS

laid in Prairie Schooner Days still serve OMAHA

MANY an airplane passenger arriving at Omaha's fine municipal airport can remember back to 1884 when the Nebraska prairies were still traversed by wagon trains. In that year was laid the oldest recorded cast iron main still serving in Omaha's gas distribution system. Longer established cities can point to records of 80, 90 and 100 years of service from cast iron gas mains that are still serving satisfactorily. In fact, present-day use of *original* mains is the rule rather than the exception. But—good as that oldtime pipe unquestionably was—economical as cast iron has been for generations—*modern* cast iron pipe is even better and more economical.

As the gas and transportation industries have developed through the decades, so also has the cast iron pressure pipe industry. Modern cast iron pipe is produced under scientific laboratory control. Today the gas engineer is provided with cast iron pipe of higher and more uniform quality than ever before, remarkable as the quality of the oldtime product has been proved to be. With the development of efficient mechanical joints for high pressure service, the cast iron pressure pipe industry meets the modern requirements of gas distribution with a product which is specified with confidence and assurance. For information, address The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Building, Chicago, Ill.

Efficient mechanical joints for cast iron gas mains are now in use and obtainable for high-pressure gas distribution.

Cast iron pipe bearing the "Q-check" trademark is obtainable from the following leading pipe founders: Alabama Pipe Company, Anniston, Ala.; American Cast Iron Pipe Company, Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Avenue, Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Company, Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe and Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Corporation, 11 Broadway, New York.

Reg. Trade Mark

CAST Q IRON

The "Q-check" symbol shown above is the registered trademark of The Cast Iron Pipe Research Association.

CAST IRON PIPE

NEW FEATURES

simplify the accurate use of wet test meters

AMERICAN Meter Company's Standard Laboratory Wet Test Meters are now equipped with a new type of gauge glass and water line marker. With these improvements the water line can be set more quickly and with greater assurance of accuracy.

New Gauge Glass

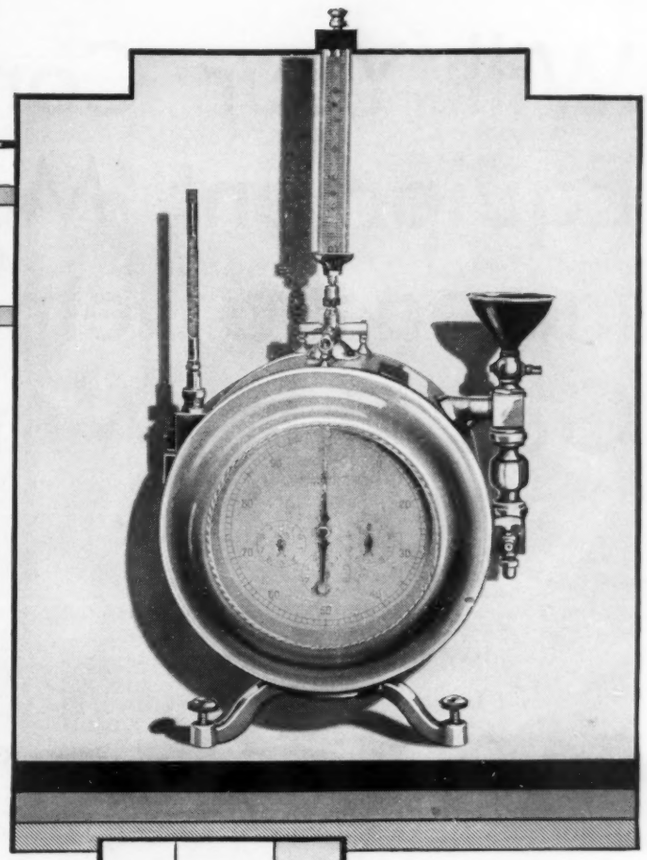
As shown in the illustration, the glass is shaped to reduce capillary attraction by providing a large cross-sectional area at the point in the water column where the meniscus forms.

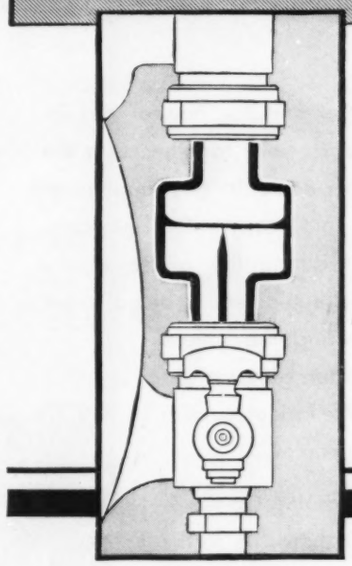
New Chromium Plated Water Line Pointer

For setting the water line a chromium-plated pointer is located centrally within the gauge glass and screwed into a bottom support. This replaces the two markers formerly used on the outside of the glass.

The threaded base of the water line pointer extends through the lower support to allow an easy adjustment, after which it is firmly held in place by a lock nut and sealing cap. Chromium plating of the pointer insures visibility and eliminates corrosion or discoloration.

D. McDonald and Company, Manufacturing Headquarters for American Meter Company Apparatus, Albany, N. Y.





These two improvements are typical of the progress in design constantly being made by American Meter Company. Write us for full information concerning Wet Test Meters, improved Protector Pressure Gauges, or other apparatus.

AMERICAN METER COMPANY
INCORPORATED
The World's Largest Manufacturers of Gas Meters and Allied Apparatus
ESTABLISHED 1836
GENERAL OFFICES : 105 W.40TH STREET · NEW YORK,N.Y.

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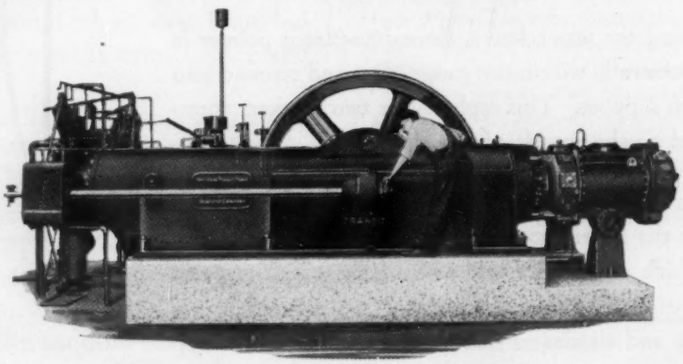
Will Your Compressing Equipment Meet the Increased Demand for Gas this Winter ?

WITH the demand for natural gas increasing each year together with the great number of domestic gas appliances which are being sold, many natural gas companies find that during the winter months their compressing equipment is being taxed to the limit. During the severe cold spells, this often causes a gas shortage due to the lack of modern compressing equipment

Gas shortages during the winter mean not only a hardship to the consumer but also a loss to the producer as well.

If you figure that you will need more gas compressing equipment this winter, remember that TRANSIT has in stock now, ready for prompt shipment, a few 17 x 24" Four Cycle, 200 H. P. Gas Engine Compressors complete with TRANSIT Compressor Equipment.



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TOOLS
for Pipe Line Construction

GAS ENGINES
GAS ENGINE GAS COMPRESSORS

THOSE COOPER-BESSEMERS SURE PUSH THE GAS THROUGH

WHEN the chief engineer and the general superintendent look over a station's monthly report, the first information they want is, "How many million cubic feet of gas did this station push through the line?"

You can expect the figures to be satisfactory—with Cooper-Bessemer Type-22's on the job. For it's the load-handling ability of these 1000 B. H P. gas-engine compressor units that makes them standard for large main-line compressor stations.

"How much did it cost to handle the gas?" is usually the second question. Station men know from experience that these double-acting four-cycle engines do big jobs on a small amount of fuel gas and lubricating oil.

We believe that if you will visit one or two Cooper-Bessemer compressor stations, you will be convinced that Type-22's are the logical units for this service.

COOPER-BESSEMER

THE COOPER-BESSEMER CORPORATION

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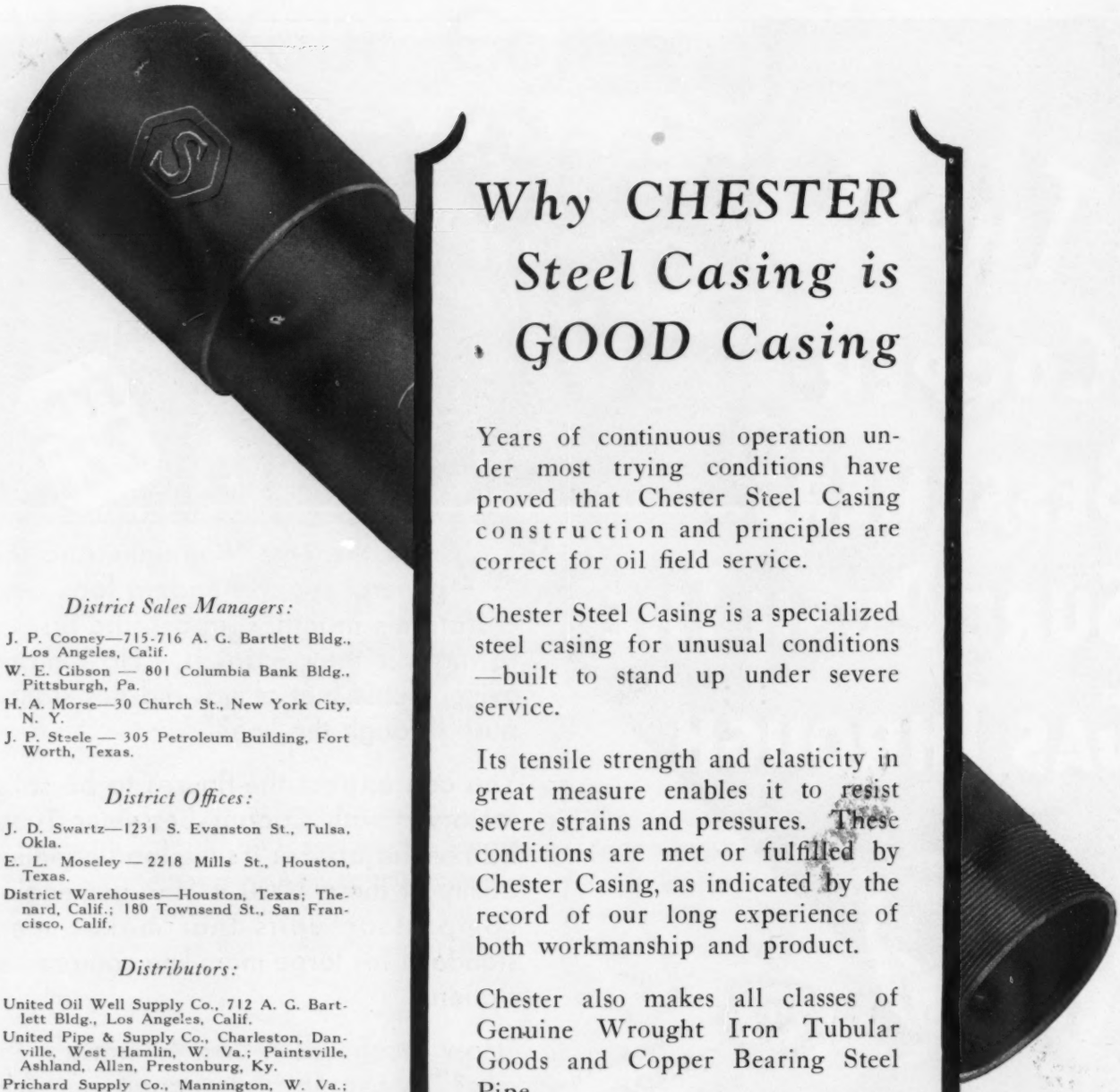
BRANCH OFFICES IN ALL PRINCIPAL OIL FIELDS



Why CHESTER Steel Casing is GOOD Casing

Years of continuous operation under most trying conditions have proved that Chester Steel Casing construction and principles are correct for oil field service.

Chester Steel Casing is a specialized steel casing for unusual conditions —built to stand up under severe service.

Its tensile strength and elasticity in great measure enables it to resist severe strains and pressures. These conditions are met or fulfilled by Chester Casing, as indicated by the record of our long experience of both workmanship and product.

Chester also makes all classes of Genuine Wrought Iron Tubular Goods and Copper Bearing Steel Pipe.

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Chester, Pa.

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CHESTER

STEEL SPECIALISTS IN CASING FOR DEEP WELL DRILLING **CASING**

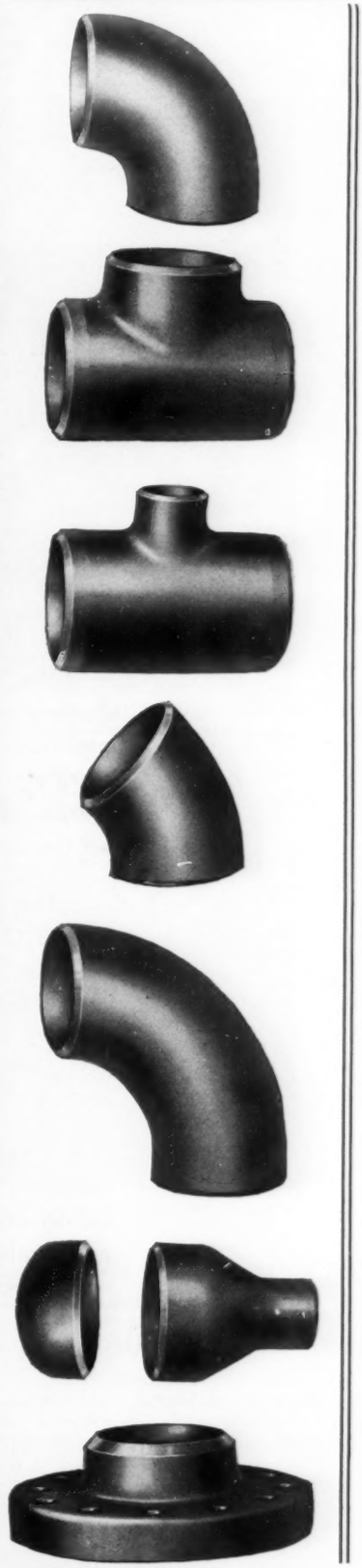
LINE **PIPE**

A COMPLETE NEW LINE OF

SEAMLESS

STEEL PIPE FITTINGS

FOR WELDING—



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Full Branch Tees
Reducing Tees
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Reducing Nipples
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DISTRIBUTED AND STOCKED IN
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2800 So. Alameda St., Los Angeles 17th and Connecticut Sts., San Francisco

TAYLOR FORGE & PIPE WORKS — CHICAGO BOX 485, CHICAGO
50 CHURCH ST., NEW YORK

Announcing

The organization of the

RELIANCE REGULATOR CORPORATION

as successor to the

RELIANCE MANUFACTURING COMPANY AND THE RELIANCE IRON WORKS.

The American Meter Company has acquired by purchase a very large interest in this corporation and it is their intention to manufacture and sell a full line of Reliance products in all eastern and midwest sections of the United States. Thereby giving this company a full line of devises for the measurement and control of gases.

The Alhambra Plant will continue to operate for the Pacific Coast trade under the former management of the Reliance Manufacturing Company and it is expected to largely increase its line of products.

This combination assures service to Reliance users in all parts of the U. S.

It is gratifying to the management of the Reliance Manufacturing Company that hereafter the great resources and selling organization of the American Meter Company will cooperate in a nationwide distribution of Reliance Products which their merits so well deserve.

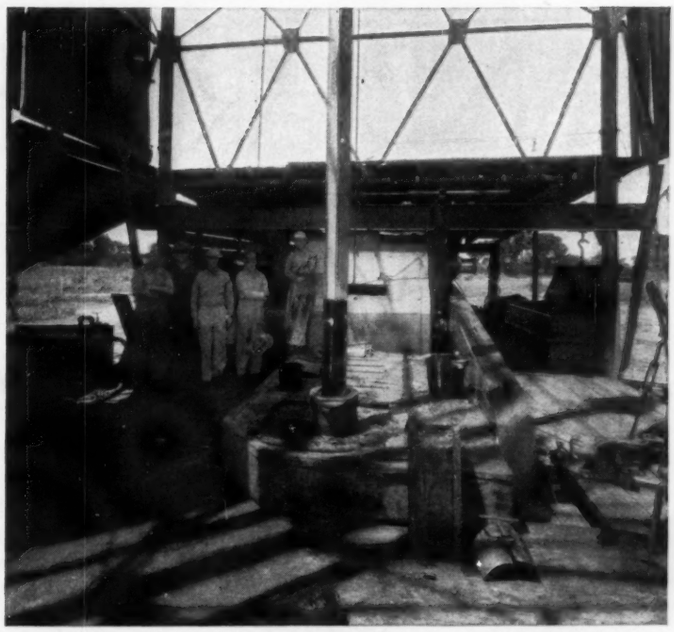
RELIANCE REGULATOR CORPORATION,

W. M. Thompson, President.

Alhambra, California.

Youngstown Seamless Drill Pipe is available in 95,000 pounds API Grade D, and 110,000 pounds API Grade E, minimum tensile strength.

In DRILLING



Rotary drilling—with Youngstown seamless in California Territory. Thousands of such wells have demonstrated that there is no superior to Youngstown drill pipe, tubing and casing.

In DISTRIBUTION

Laying a line of Youngstown 20" electric-weld pipe in Virginia.

OUT in the fields where wells are drilled or—stretching across the country to the centers of consumption, Youngstown steel pipe is serving the oil and gas industries in wells and pipe lines.

■ Whatever the service, whatever the conditions, the strength and endurance of this fine steel pipe is evidenced by its long life, its ability to stand abuse and its resistance to the corrosive actions of soil, atmosphere and moisture.

■ Thousands of miles of Youngstown pipe—in wells and pipe lines—have proved to oil and gas men the country over that Youngstown is a safe investment for every pipe need.

THE YOUNGSTOWN SHEET & TUBE CO.

One of the oldest manufacturers of copper-steel, under the well-known and established trade name "Copperoid"

General Offices: **YOUNGSTOWN, OHIO**

Distributors:

CONTINENTAL SUPPLY CO. *1501 Locust Street, St. Louis, Mo.*

INTERNATIONAL SUPPLY CO. *Tulsa, Okla.*

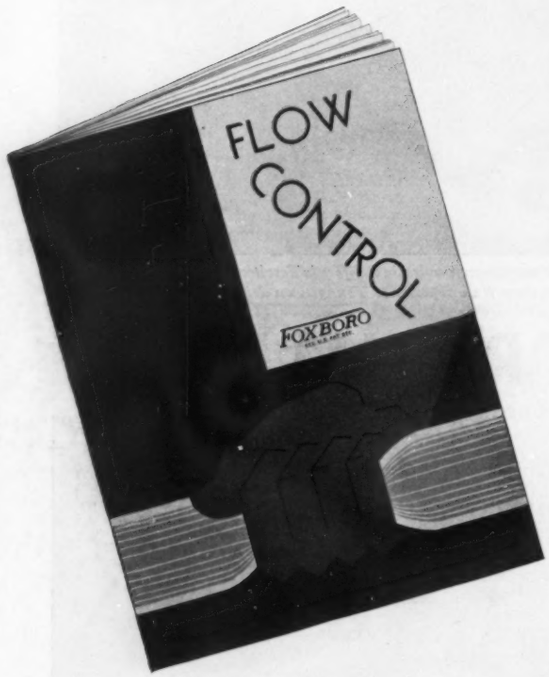
REPUBLIC SUPPLY CO., *2122 East 7th Street, Los Angeles, Cal.*

YOUNGSTOWN

FROM ORE MINE TO GAS LINE

STANDARDIZE

REFINERY REACTIONS
GASOLINE TREATING
CHEMICAL PROCESSES



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Photograph shows the Hydrauger running a bore under a busy street. Traffic goes on as usual and no pavement cutting is required.

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"The Mechanical Gopher"

December, 1931

WESTERN GAS

"Reg. U. S. Pat. Off."

Vol. VII, No. 12

A Monthly Journal of the Gas and Gas Appliance Industries in *Western America*

Review of the Month

THE U. S. Supreme Court decision in the Bandini Petroleum Co. case, rendered late in November, is another step in the direction of effective natural gas conservation. Constitutionality of the California gas law is sustained, and impetus given this type of legislation, already enacted in California, Oklahoma and Texas. Several important implications are carried in the court's decision. With the judgment resting upon the regulation of correlative rights of surface owners, the principle of proration is supported. The term "unreasonable waste of natural gas" is held sufficiently certain for administration of the measure. Blowing gas to the air is accepted as prima facie evidence of waste. Apparently the court's action has opened the way to practical enforcement of the act, though the charge of unconstitutionality may be raised against the methods adopted for administering it.

Supreme Court Bans Tax on Interstate Lines

Another Supreme Court decision of moment to the natural gas industry was handed down on November 23, when it was determined that the State of Mississippi may not tax interstate pipe lines. The state had sought to levy a license tax against the Interstate Natural Gas Co., based upon the size and number of miles of pipe within the state.

No Closed Season on Rate Agitation

Recent adoption of a resolution by an organization of Texas communities, urging city councils to enact rate reduction ordinances, without investigation into the fairness of present rates, is perhaps the most flagrant instance of "utility baiting" which has arisen for many a day. No fair-minded public, in the Southwest or elsewhere, will condone such action if the facts are put before them. By way of contrast it is refreshing to note the stand of several leading Southwest companies which in November began action to protect their service and properties against confiscatory rates. Necessity for litigation is always to be regretted, but rate agitation of the type which has swept through the Southwest in recent months cannot be allowed to go unchallenged when the future of utility service is at stake.

Bottled Gas Distributors Join Forces

With formation of the National Bottled Gas Association, distributors in this industry are prepared to work out their problems together. The new group will function particularly to improve sales methods, and should have much to do with the sound future growth of bottled gas service. At another point in this issue, Mark Anton, president of the National Bottled Gas Association, outlines the field in which the organization plans to serve.

More Converts for the Therm Basis

Therm billing continues to gain in favor with the American gas industry. In November the Seattle Gas Co. offered its consumers an optional therm rate; the Central Illinois Public Service Co. recently adopted this basis for its billing, and other utilities are considering instituting the therm. Following a year's experience with therm billing the Peoples Gas Light and Coke Co. recently reported that only 460 of its 900,000 customers have requested that the traditional cubic foot method be retained for their accounts.

Pipe Liners Continue Progress

Two transmission line completions, in largest diameter pipe laid to date, mark the month of November. Southern Fuel Co. placed finishing touches upon its 26-inch Kettleman-Long Beach line, 213 miles in length; Northern Natural System completed its 183-mile Clifton to Mullinville, Kan., link, also of 26-inch.

Mixed gas service appears to be in the offing for two important centers, St. Louis, Mo., and Nashville, Tenn. The Laclede Gas Light Co., serving St. Louis, is reported negotiating with Mississippi River Fuel Corp., which now serves industries of the city, for a supplementary natural gas supply. Possibility is also seen that a second line from Louisiana fields might be called for. Nashville Gas & Heating Co. is understood to have contracted with Missouri Kansas Pipe Line Co. for a line extension to bring Kentucky gas for blending with Nashville's manufactured product.

Linking of Texas and eastern gas reserves into a common pipe line system is now an accomplished fact, with the completion last month of the Ohio Fuel Gas Co.'s line. This line extends from Muncie to Rockport, Indiana, forming the final link joining the Panhandle-Eastern Pipe Line system at the Indiana-Illinois state line, and the Columbia Gas & Electric Co. system.

Christmas Adds Value *to the* Window *and* Sales Floor

Use Home Comfort from Gas as Seasonal Display Theme

STARTING early in December, gas company display windows and sales floors will put on a holiday air. Ordinary sales appeal of high quality domestic appliances will be fortified by the traditional association of glowing fires, well cooked food and comfortable surroundings which go with the Christmas season. Christmas revolves about the home, as does no other holiday, giving the gas company an unexcelled opportunity to feature the home services which it renders through modern appliances. Just as the electric utility has capitalized the outdoor Christmas tree, so the gas company can make the most of indoor comforts which are available in their best form through gas usage. Holiday displays should give forceful expression to this message.

Christmas has its time honored symbols, which the display manager will wisely observe, no matter how modern his treatment may be. Space heaters, ranges, water heaters, gas-fired refrigerators and warm air heating plants—in fact the whole list of domestic gas appliances will be shown effectively and appropriately amid Christmas trees, evergreen wreaths, tinsel and bright colors, with the "gift theme" emphasized. But the gas company window and display floor must vie with the attention-getting efforts of every merchant in town, and half-way efforts will miss the mark.

To stimulate thought on the Christmas display theme and perhaps provide one or two ideas which may be adapted to direct use, *Western Gas* on the page opposite, presents a few of the well planned and executed displays employed by gas companies throughout the West during the 1930 season. These views are offered through the cooperation of commercial or display managers of the companies represented.

Among several other displays, Laclede Gas Light Co., under the direction of S. C. Reiser, display manager, showed a window of Humphrey Radiantfires. (Fig. 8). The background was formed of silver curtains with a modern art design in color as a border across the bottom. On a platform at the rear was a cut-out of three Christmas carolers painted in brilliant poster colors, each bearing a large candle. In front of this was a large radiant heater of English design, and written in Old English type across the double pages of an open book in the foreground was the legend "The ruddy glow of an open fire is part of the Christmas spirit."

Another Laclede branch store featured a huge paper maché Santa Claus as a background for several appliances. Santa was gazing at the merchandise with a benign air, while across his outstretched arms was hung a large red velvet robe. Concealed behind the display was a flood light directed to Santa Claus' face, giving it a ruddy glow and catching the attention of passing crowds.

BRITISH COLUMBIA Electric Railway Co., Ltd., Vancouver, B. C., featured a window with wreaths and tinsel as a background for several gas appliances, including a range, gas-fired refrigerator, water heater, Humphrey mantle, gas logs and radiant-type space heaters. (Fig. 6).

Peoples Gas Stores, Inc., affiliated with Peoples Gas Light & Coke Co., Chicago, had several window and floor displays which attracted the favorable notice of Chicago's holiday crowds. One window (Fig. 7), was transformed into a basement play-room, with a large Christmas tree, dolls, toys and life-like models to represent children at play as the decorative motif. At the left was a central heating plant for the home, bringing out forcefully the idea of the cleanliness of gas as a heating agent. The display was planned in vivid colorings, and according to H. H. Swenson, director of displays for Peoples Gas Stores, was an unusual interest getter.

A second display of that company (Fig. 1) featured the Electrolux refrigerator, three models of which were shown—the central one against a chromium backpiece upon which colored lights were turned. Snowflake patterns formed the general background. The figure of a man in the dress of a century or more ago carrying a lantern in his hand illustrated the caption to this display—"Search with fagot or lantern, you will find no present for the family more welcome than the gas operated Electrolux." Figures of children in old-fashioned garb completed the setting.

An effective water heater display by Peoples Gas Stores, Inc. had for its central feature a large size water heater tied with Christmas ribbons. The background was a huge snowball being rolled by a boy in winter sports costume of bright colors. A snow laden fir tree and the figure of a little girl made the display complete. The figures were done in strong colors and placed in "real" snow.

A gas range shown against drop curtains of chromium, blue hangings and panels which reflected the light, was another window display by this company. A large illuminated holly wreath tied with silver cloth was hung against the backdrop, trailing its silver ribbons on the range.

Southern Counties Gas Co., Los Angeles, Calif., planned holiday features for each of its district offices. At the San Pedro office a floor display of ranges and a gas-fired buffet type refrigerator were very effective. (Fig. 5). The central figure on the floor was a Roper range going down a large red brick chimney. The background for this was a group of Christmas trees of poster type. Festoons of silver tinsel with red paper bells added a brilliant touch.

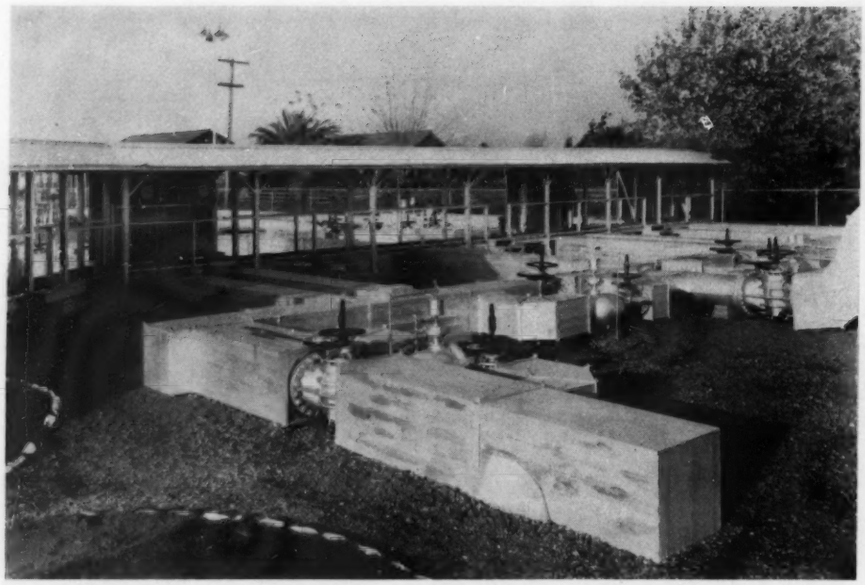
IN CONNECTION with its 1931 program for holiday display, Southern Counties Gas Co. is conducting a contest, giving prizes for the best window or floor displays in holiday dress in the district and sub-district offices of the company. A first prize of $15 will be the award for district offices and $10 for sub-district offices. Second prizes will be $10 for district offices and $5 for sub-district offices. The following rules will govern the contest:

All displays must be in position by December 5. District offices are limited to $25 and sub-district offices to $10 for materials. Prizes will be awarded on the basis of (1) Beauty—in portrayal of the Christmas spirit and in the arrangement of merchandise—maximum of 40 points. (2) Sales Value — Useful gifts for

(Continued on Page 45)

Last Season's Holiday Window Trims and Sales Floors

(1.) Peoples Gas Stores, Inc.
(2.) Portland Gas & Coke Co.
(3.) Portland Gas & Coke Co.
(4.) Public Service Co. of Colorado
(5.) Southern Counties Gas Co.
(6.) B. C. Electric Railway Co.
(7.) Peoples Gas Stores, Inc.
(8.) Laclede Gas Light Co.



Showing tongue and groove box built in 5-foot sections for sound proofing Milpitas Meter Station of P. G. and E. Granulated Banrock is tamped around piping; 6-inch clearing is allowed between box and pipe.

Sound Proof Insulation *for* Natural Gas Piping

By O. A. PHILPOTT

Office Engineer,
*Pacific Gas and Electric Co.**

THE flow of natural gas through piping sometimes creates considerable noise, which depends chiefly upon the kinds of valves, regulators, meters, etc., through which the gas has to pass. A vibrating body is essential to the production of sound and an elastic medium, either solid, liquid or gas in contact with this body is required to transmit the vibrations. Thus a vibrating mass of air or gas in a solid enclosure, a regulator valve, orifice meter disc, etc., may produce sound. In a regulator and meter station most of the sound is probably produced by the regulators, valves and meter discs.

Large quantities of gas may be passed through certain kinds of piping, producing but very little sound, and in other installations considerable noise may be created. Gas flowing at the rate of 215 million cubic feet per day, through the cooling coils and headers at the Kettleman Hills Compressor Station, produces practically no noise, yet only a few million cubic feet per day through some meter or regulator installation may create a very loud sound, and in order to eliminate this, some kind of absorbing material is necessary. At Milpitas Meter Station 3,250,000 cubic feet of gas per hour flowing through the pipes with valves wide open, regulators by-passed and flowing through five bends caused no noise, but just as soon as one of the valves was throttled, vibration set in and considerable sound was produced.

Sound waves travel through solid, liquid or gaseous substances at a velocity depending upon the elasticity and density of the substances, according to the formula:

$V = E/d$ where V, E and d represent velocity, elasticity and density. In air the velocity is 1088, water 4827, pine wood, 10,900, brick 11,980, and steel 16,360 feet per second.

The velocity of sound will vary directly as the square root of the absolute temperature, but it is not influenced by pressure.

The intensity of a sound refers to a quantity which determines the rate of supply of vibrational energy. Loudness corresponds to the degree of sensation and is dependent on the intensity of the sound and the sensitiveness of the air. Frequency is the number of regular or periodic vibrations per second. Sounds arrange themselves in a natural order, according to pitch, which depends on the frequency of the vibration. The greater the frequency the higher the pitch.

The absorption of sound is the essential factor in the solution of sound insulation and it is not sufficient to reflect and scatter the sound waves, for the energy cannot be destroyed in this manner. It must be absorbed, that is, converted into heat by friction.

When the air space in which sound is passing becomes small in cross section, friction occurs between the sides of the passage and the oscillating air particles, which converts the wave energy into heat.

Buildings are acoustically treated by lining the walls and ceiling with some kind of absorbing material, and the passage of sound from one room to another may be prevented by filling the partition with a satisfactory substance. There are many kinds of material on the market that may be used but, with the exception of Banrock and a very few others that have a suitable coefficient of absorption, they are subject to damage by fire.

Considerable work has been done in the acoustical treatment of buildings by Professor W. C. Sabine, Professor F. R. Watson, V. O. Knudsen and others, but so far as I know, very little in the way of sound-proofing pipe lines. However, as stated above, the sound must be absorbed, not reflected, and the results of their experiments with different materials should apply to pipe out in the open as well as when used for sound absorption in a room.

In order to have some basis of calculation, a unit of absorption has been chosen as one square foot of surface, which absorbs all the sound and reflects none. An open window absorbs all the sound from without and thus is assumed to have a coefficient of absorption of one.

The absorption coefficient varies with the frequency or pitch of the sound and in the selection of a material the frequency should be known as this varies for different piping installations. A material might be satisfactory for one frequency but not so suitable for another. The absorption coefficients of a material become greater with the increase of frequency until frequency reaches a certain point and then as a rule they begin to decrease. In the majority of tests made,

(Continued on Page 54)

*Presented before the Pacific Coast Gas Association, at San Francisco, Calif., November 19-20, 1931.

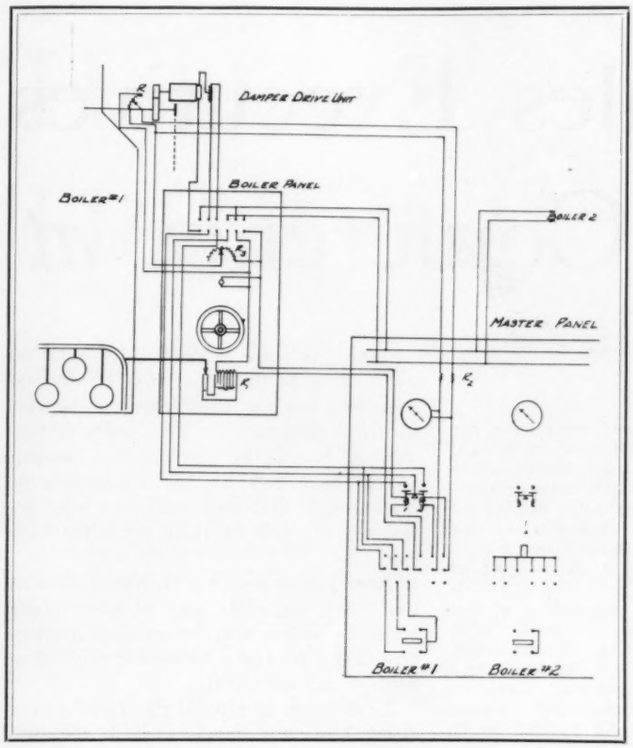


Fig. 1. Connections

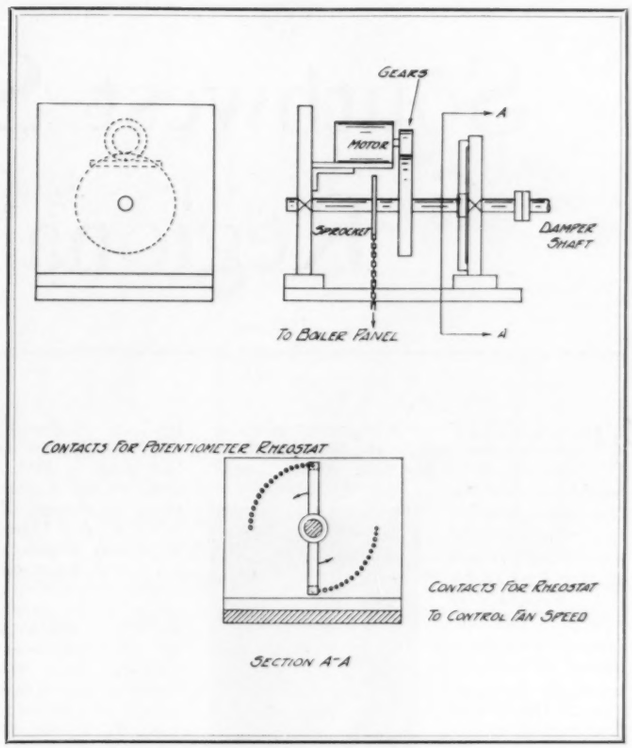


Fig. 2. Damper drive unit

Electro-Automatic Draft Control *for* Steam Boilers

By GEORGE H. LOGAN

Electric Distribution Department
Los Angeles Gas and Electric Corporation

IT is well known that to maintain efficiency with steam boilers, it is paramount that the correct amount of air for combustion be supplied at all loads. In most steam plants the load is subject to frequent fluctuations. Assuming the existent system is non-automatic, it is impossible for the fireman to correct the air supply coincident with changed demand on the boiler. This is particularly true of a battery installation.

The object of the system described in this paper is to adjust air supply equipment for gas- and oil-fired boilers to optimum position simultaneous with a change in burner pressure.

Operation, Full Automatic

The schematic representation in Fig. 1 contemplates three forms of control: full automatic, delayed automatic (or push button), and manual. Any boiler of a battery may be operated on the type desired.

Consider the conditions resultant upon an increase in load. The demand for steam exceeds the supply, and header pressure drops. To maintain this pressure at its correct value, the operator will increase the rate at which gas or oil is fed to the burners. He accomplishes this by increasing the burner pressure. Depicted on the boiler panel is a modified U tube, with fuel pressure admitted to smaller leg. A depression of mercury in this leg, and a corresponding rise in other shorts out part of resistance R_1. This sequence increases the current in coil 1 of the balance type relay. Plunger 1 is pulled down and 2 goes up, thereby impressing voltage upon the series motor incorporated in damper drive unit. It is noted one brush is connected to the middle of the series field. Simultaneous with plunger 2 making contact, current is sent through the section of the field which will cause rotation to open the damper.

Integral with damper drive unit is a rheostat connected as a potentiometer. The moving arm is arranged to rotate through the same angle as damper shaft. Hence as the motor rotates damper shaft (through suitable reduction gears) to provide greater opening, the output voltage of the potentiometer is increased. This voltage in turn increases the current flowing through coil 2, thus tending to bring the relay to open circuit. The constants of the system are designed so that equilibrium is realized when the damper has reached its optimum position for the given burner pressure.

R_3 is a resistance in series with the input to R. The system is calibrated with R_3 a normal value, that is, with one half R_3 in circuit. Its inclusion

(Continued on Page 57)

Southwest Sales Executives Regional Conference *at*

PRACTICALLY every important gas distributing company in the Southwest was represented by key men at the Second Southwest Natural Gas Sales Conference, which met for a two-day session at Hot Springs, Ark., November 16 and 17. The conference was conducted as an activity of the American Gas Association Commercial Section, of which J. W. West, Jr., is secretary, as a part of the Association's regional sales meetings program which has met with such success during the past two or three years. The Hot Springs meetings drew an attendance of almost 200, and were on a par with the highly successful conference held last year in Dallas, Texas. Headquarters were at the Arlington Hotel, with arrangements in charge of a committee headed by Sterling A. Lipscombe, chairman of the Southwest Regional Gas Sales Council.

J. W. West, Jr.

In one form or another the subject of dealer cooperation was given much prominence in the papers and discussions at Hot Springs. House heating, industrial sales, refrigeration, house cooling by gas, sales training, were other major heads around which program features centered. Manufacturers representatives contributed several valuable discussions, and the two papers by salesmen "from the firing line," were also of much interest.

In the following pages *Western Gas* presents several of the papers given at the Hot Springs meetings. While these are not published in their entirety, due to space limitations, the portions given will hold much interest for sales and advertising executives.—*Editor.*

Leadership *in* Dealer Relations

PAUL RENSHAW

Advertising Manager
Memphis Power & Light Company
Memphis, Tennessee

THIS PROGRAM feature was given under the head, "Advertising for Future Sales." The sections referring to the stand which Mr. Renshaw's company has taken on dealer cooperation are particularly significant, and are covered in these extracts from the paper.—*Editor.*

ADVERTISING is so closely interwoven with merchandising that, particularly at this time when utilities are striving to have their policies more clearly understood, some statement relating to our efforts along this line seems appropriate as a part of this paper.

First, let it be understood that utilities have an obligation to merchandise the appliances that consume their product. The sale of these appliances by us is of benefit to the public, because it makes the conveniences of gas service more generally available. Primarily we are selling a service—not a commodity that can be weighed by the pound. But before we can sell our service, there must first be sold an appliance that makes possible the use of the service—for some appliance is indispensable in the use of gas. It is in the public's interest that standard appliances have been sold by utilities, at fair prices, and on terms that have made it possible for thousands of customers to enjoy the conveniences and comforts of gas service which they would otherwise have been denied.

Building the Market

Consistent advertising on the part of utilities has created a wider public acceptance of appliances as they have been developed and perfected; and, largely as a result of this promotional work, other dealers are enjoying an excellent business from their sale.

It needs to be emphasized by us, however—and some of our dealer friends do not seem to have learned this—that we want them to continue to sell these appliances; and we want them to be able to do it profitably. The truth is that utilities benefit by the greatest possible distribution and use of appliances on their lines; and they welcome and encourage the sale of them by other dealers.

Best policy for the utilities dictates that they stimulate sale of good appliances by other merchants and dealers; and that a cordial relationship with these dealers be developed.

Leadership in promoting friendly relations, however, devolves upon the utilities. We owe it to ourselves and to the dealers to have clear understandings that will promote larger business and better accord.

Incidentally, we deny that our methods of merchandising are unfair; but we insist that misunderstandings can best be settled by cooperation which utilities welcome with dealers. Legislation directed against utilities, or any particular class, would be discriminatory and therefore unjust. And, legislation prohibiting any class from selling appliances would not relieve possible future misunderstandings between those who continued to merchandise them.

Changing times require new methods in merchandising. And fixed laws would prohibit flexibility in adapting needs to merchandising.

In our own company, in order to cultivate a broader understanding with the dealers of our community, we have been pursuing a program during the past month of definite dealer relationships.

Our first step in this program was through our advertising. In an advertisement of practically full page, we displayed the invitation, "Buy appliances from your Dealer or this Company".

We followed that advertisement with a series of ads on gas water heaters; and later a series on other gas burning appliances; and in each series there was prominently displayed the same invitation, "Buy Appliances from your Dealer", this appearing over our signature.

Following the insertion of the first advertisement along this line the merchandise manager, together with the ad-

Hold Hot Springs

vertising manager, personally visited the principal dealers in gas appliances throughout our city. Calls were made on the department stores, furniture dealers and hardware dealers; and in each case a full statement of our policies was made to them. It is worth remarking and emphasizing that during these conversations many misunderstandings on their part, some relating to very incidental matters concerning our policies, were corrected. For example, some of them expressed the belief that it was our policy to cut off our service for non-payment of merchandise bill—which of course was a misunderstanding. To our surprise we found that there were other misunderstandings quite as definite on their part; and of course the visits and discussions with them enabled our company to eliminate many of these.

In addition to our consistent invitation in the newspaper advertisements for the public to patronize dealers, we have also appropriated the use of some of our outdoor boards for this same purpose. We have borrowed the idea of the Brooklyn Gas Co. for this, and are using 20 boards for each of the six posters in their series, featuring the idea of "Gas the Great American Servant", and the symbol of the dealer selling approved appliances.

In our newspaper advertising also we have adapted our terms on appliances to a basis that is agreeable to the dealers, as determined upon in the conversations at the time of our visits with them.

A Set Policy

As a further measure in developing a more thorough understanding between the dealers in gas appliances and our company, and to promote cordial relations that are mutually beneficial, we have produced a definite written statement on merchandising policy which the dealers have been apprised of, and to which we are rigidly adhering in our advertising as well as our selling. This statement is in two parts: Part A states that we are in accord with the statement of "Merchandise Procedure", as approved by the National Association, which sets forth nine points that are familiar to most utility men.

Part B further avows our sincere desire to help promote the sale of appliances, whether a customer may buy from our company or any other dealer; and to this end gives assurance on these points:

1. To maintain "list prices" on merchandise, unless some special event arises, in which case we are willing to advise dealers.
2. Not to give excessive trade-in allowances.
3. To adapt our terms, so far as reasonable, to a basis that is practicable for other dealers.
4. To do promotional advertising, that shall invite the public to buy standard appliances either from ourselves or the dealer of their choice.
5. To continue to counsel our sales forces to refrain from remarks that may possibly be interpreted by prospects as derogatory to any dealer's merchandise.
6. To go to any reasonable lengths to make our sales organization the "allies" to all dealers.
7. To give the same measure of "service" on all appliances, whether purchased from us, or from a dealer. (In this connection we emphasize the clear distinction between "service" and "repairs.")
8. To make "connections" on gas appliances as readily and promptly on appliances purchased from other dealers as on those sold by us.
9. To make extensions of gas mains as readily for customers who buy from other dealers as from us.
10. To cooperate with dealers as far as we reasonably can both in promoting mutually profitable merchandising activities and in satisfactorily adjusting any and every particular incident that may arise to affect our relations.

THREE samples of current advertising prepared by the Lone Star Gas Co. and the Dallas Gas Co. are reproduced on this and following pages.

IT WILL be noted that a dealer tie-in is given prominence in each piece of copy.

Aw! Mom!
THE WATER'S COLD!
Can you blame him for leaving "water marks" when the dirt clings like glue with cold wash water? It's always difficult to teach children the habit of cleanliness where there is an undependable hot water supply.
For a few pennies a day you can make the "hot faucet mean what it says. Mother, too, will appreciate the unfailing reserve for housecleaning, dishes and the laundry.
Your Plumber, Gas Appliance Dealer or your Gas Company will gladly tell you how easily you can install automatic HOT WATER SERVICE
Stop in during our Special Sale of Rival Water Heaters and investigate the low price, terms and special inducements that make it worth your while to install a water heater NOW.
THE RIVAL
Automatic Water Heater
Sizes
12 Gal. to 50 Gal.
LONE STAR GAS COMPANY
FORT WORTH DIVISION
MONROE STREET AT ELEVENTH

A Stand for Employees

Supplementary to all this, we have issued what we term a "Code of Ethics for Employees" which pledges the individual in our organization to those principles of conduct which support the fundamental points of our institution's policy, and treat the dealer in gas appliances as an ally to our organization. Here is the pledge:

1. I will regard other dealers who are selling standard gas appliances as our allies in promoting the sale of these appliances, and I will treat their representatives as our associates in making load-building activities successful.
2. As an evidence of my personal friendly feeling, and my desire to see every other legitimate dealer succeed, I will refrain from doing these things:

"Knocking" the merchandise they sell.

Leaving the impression that their product is not standard or is inferior.

Inferring that repairs or replacements cannot be secured.

Minimizing the dealer's ability to service the equipment he sells.

Intimating that the dealer will probably cease handling this equipment.

Cutting prices or extending terms beyond those regularly established.

Making remarks not complimentary of merchandise the customer has purchased of others, or has on trial, or mentions being interested in.

Condemning faulty dealer-sold equipment to the customer; but, purely as a measure of service to customers, will advise the dealer of defects or conditions that

might cause trouble, and so give them an opportunity to correct faulty conditions.

3. I acknowledge that my interests are best served by fair dealings, and I will endeavor at all times to accord my words and deeds with the policies of my company, in the high aim to promote friendly relations with every dealer and every individual customer of the company.

This mention of our cooperative policy with dealers is made because we feel that continued successful merchandising, if it is to produce larger returns, should follow the policy of promoting sales through every type of responsible dealer. It is by the activity of the utility that a consciousness is created and maintained in a community for the use of gas service. It is through the utility's leadership and promotional activity that the advertising and sales effort of the dealers, as well as themselves, can be made most effective.

Advertising *and the* Dealer . . . .

WILLARD G. WIEGEL
Assistant Advertising Manager
Lone Star Gas Company

TO increase the greater acceptance and use of gas service we must sell appliances, because they provide the only market for our product and play an indispensable and leading part in the type of gas service rendered.

W. G. Wiegel

Since both the gas and the appliances are so interlocked in the promotion of better gas service, it is important, in fact imperative, that we retail and *educate the public to want* appliances of the most improved and safest types—and assist in keeping those appliances in perfect working order—if the customer is to receive the highest type of gas service.

The utility that proceeds with the business of promoting gas sales in this frame of mind and reflects this policy in its advertising and sales efforts needs no alibi as to its gas promotional activities.

Dealers in other lines of merchandise quite often include gas and other utility appliances in their stocks. Obviously it should be the policy of the utility to cooperate in every way possible with these merchants because they are helping us in our ultimate aim—and which is equally important, to convince these merchants that we are cooperating.

Regardless of how carefully a sales manager plans his mark-up, terms of sale, trade-in allowances, etc., the dealer has no way of knowing of your continued cooperation unless the general attitude of your company reflects itself in your advertising. Advertising is the official voice of your company. It reflects the attitudes, modes and desires of the organization, and with each ad the policy of the company is recorded.

An example in connection with dealer cooperative advertising will illustrate what I mean by convincing the dealer.

A Case in Point

About a year ago the advertising manager of a leading newspaper in a town served by one of our companies, called at the office and requested us to display and advertise automatic water heaters in a cooking school which his paper was sponsoring. I asked him, "Why water heaters? Why not a modern gas range?" He frankly told me that he had purposely made tentative arrangements with the local electric company to use an electric range for the cooking demonstration. He felt that if he used the particular brand of gas range which the gas company carried in stock for his cooking demonstration that the furniture dealers, hardware merchants and department stores who sold gas ranges of other manufacturers would not support his school.

We pointed out to him that he had the wrong impression of gas company merchandising—that we were primarily interested in increasing the acceptance and use of gas service. We suggested that an electric range demonstration helped only one institution in his city, as no one sold electric ranges but the electric company. On the other hand, five or six of his leading merchants sold approved gas ranges. Ninety-eight per cent of the ladies who would attend the school were already using gas for cooking and had been for years. No doubt many were prospects for new equipment and if he really wanted to benefit the local merchants whose daily advertising supported his paper, he should help keep the public sold on the kind of equipment these merchants were selling by holding his cooking demonstration with gas. As far as the gas company was concerned, he could arrange for the local merchants to display their new ranges, and we would give momentum to the program by carrying educational advertising on the labor saving features and all around desirability of up-to-date gas fired cooking equipment in general.

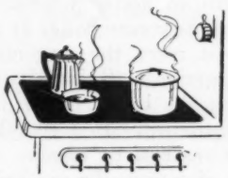
Needless to say, the solicitor repeated our attitude to the local merchants who jumped at the opportunity to participate in the school and feature their particular line of gas ranges and have the gas company do the educational advertising about the advantages of this up-to-date equipment. Any live merchant understands the value of educating the public to accept an idea as a basis of increased sales.

In this instance advertising accomplished two purposes: first, it was responsible for keeping the public gas minded by directing the attention away from a fuel that threatened to retard the greater acceptance and use of our service; second, it convinced the dealers that we were really sincere in our desire to assist them in selling equipment using our service by educating the public to the advantages of modern gas ranges.

May I suggest that you include your dealers in *all* your advertising plans. If you are putting on a sale to stimulate

?
Your Plumber, Gas Appliance Dealer or your Gas Company will gladly tell you how easily you can install automatic hot water service.
There is nothing more provoking than a HOT faucet that runs COLD!
Disappointing hot water faucets upset the whole schedule of household affairs. What a difference with an Automatic Gas Water Heater! Any minute of the day or night, it responds to the turn of a faucet with a cupful or a tubful of water heated to the ideal temperature. It starts itself—it stops itself—AUTOMATICALLY.
HOT WATER SPECIAL
LONE STAR GAS CO.
FORT WORTH DIVISION
Monroe at Eleventh

Some Cooking Advantages Are Not Due Entirely to the Fuel Used . . .



For Instance . . .

COOL KITCHEN—It's oven insulation that makes the kitchen cool. Modern Gas Ranges have it.

HEAT CONTROL—It's the thermostat that controls the temperature of the oven . . . and it works superbly with Gas fuel.

BUT . . . *one thing you can't have with other fuels is the great economy of gas fuel!*

and it's gas *alone* that gives you these features

SPEED—Quick, intense heat the moment you light the burner.

FLEXIBILITY—By turning a lever you have *twenty-five* different degrees of heat at your beck and call. Why be limited to a few?

DEPENDABILITY—Gas is the fuel that never fails.

STYLE—Gas Ranges set the style.

1/3 ct. . . . It costs you only 1-3 cent per person to cook a meal with natural gas.

Look Them Over!

Gas Ranges are on display at your dealer's and in the display rooms of the gas company. Their low cost will be especially interesting.

LONE STAR GAS SYSTEM

The Dallas Gas Company

the movement of appliances for heating, cooking and hot water service—call or write the dealers advising them of this promotional activity in advance and give them an opportunity to profit by the interest created by your advertising during this period. Invite them to tie-in with your selling program and receive a proportionate benefit.

I wonder if it has ever occurred to you to analyze why some dealers look upon the utility that sells gas appliances as a competitor? There is an understandable reason for this if you look at it from his point of view. The fact that our service has created a market for the appliances he is selling means nothing to him, because he is accustomed to having markets created for him. He stocks gas appliances for the same reason that the grocer stocks Campbell Soups, Ivory Soap, or any nationally advertised goods that the public has been educated to want. He is like the druggist who sells tooth paste. The druggist did not create the demand for tooth paste and never spent a dollar, nor does he ever intend to, in telling people about the care of teeth. He is interested only in supplying the demand for something the public has been educated to want.

Getting the Dealer's Angle

The dealer thinks of gas ranges, space heaters, water heaters, etc., in terms of goods to be sold, stock turn-overs, sales tickets that mean money in the cash register. Unless you prove to him through your advertising that you are helping him by keeping the public gas minded and educating them to want up-to-date equipment, you are just another stove peddler to him and just as much a competitor in his eyes as the furniture store down the street that suddenly stocks a quantity of egg beaters like those he has been selling for 30 years.

There is no question but what advertising must be a part of your dealer cooperation program—and as in all instances, the most effective advertising is the most informative. Utility advertising which simply urges people to buy goods has no place in the greater promotion of the acceptance and use of gas service and is of little help to the dealer. So-called merchandising advertising should, in my opinion, do more than wave a red sale flag to tempt customers. It should interpret gas appliances in terms of usefulness and desirability. Advertising should tell the customer how to use our service more efficiently, more thoroughly and more satisfactorily *with modern equipment*—so as to get the most value and the greatest results from our service. Advertising of this kind, in the long run, is more profitable than any ballyhoo that can be devised.

Naturally your advertising must keep the public advised of the particular brands of equipment that your company carries in stock. Obviously, you must tell them about the attractive features of these individual brands, but your advertising should never overlook the fact that other approved models are sold by your local dealers and because you are primarily in the business of selling gas service your first job is to remember that fact and sell the public on the advantages of modern equipment and what it will accomplish. The greater desire created by your advertising for up-to-to-date equipment, the more prospective customers for everyone concerned.

Incidentally, this kind of advertising will have its effect on the public. This is the day of specialists and people like to feel that the information they are receiving is supplied by an expert. When they have reached the point where they are prospects a great percentage of them will come to your sales rooms for further information, assuming that you know more about modern gas equipment than anyone else in town. Your advertising can be made to create this favorable impression for the kind of merchandise you have been recommending.

Put your arm around the dealer by keeping the public "sold" on approved gas appliances. Remember he is first a merchandiser—interested in selling goods that the people want to buy; and it's the job of your advertising to see that they want to buy them. If enough people ever become educated to wanting some other kind of fuel-burning equipment, he'll stock it. Make no mistake about that!

Some of you remember when the dealer sold coal stoves and then the public started asking for gas-fired equipment. Almost as soon as he put a gas range in the window he moved the coal stove into stock in the back and concentrated on gas ranges. Let your advertising help him keep the gas equipment up in front.

Central Plant Heating . . . . . .

E. C. WHITCOMB

Lone Star Gas Company
Fort Worth, Texas

EVERY section of the country has its individual problems in house heating. It is doubtful, though, if any district presents a greater diversification than that of the Southwest. The scarcity of basements is, of course, an obstacle, and with this too, often goes the lack of adequate flues and in some cases their complete absence. These constructional obstacles, coupled with an extremely wide fluctuation of temperatures, plus the lack of general acceptance of central heating, are only a few of the difficulties confronting the house heating engineer and his sales force.

We must create a desire for winter comfort, or better still, with house cooling just about to become a reality, we have a very strong ally and may rightfully wage our campaign for "Year Around Home Comfort".

The work necessary in all this is varied. Architects and contract builders must be contacted and brought to see

the advantages and necessity even of properly laid out and installed heating equipment. If they can not be prevailed upon to actually incorporate proper heating, they should at least provide adequate flues properly located and carried to sufficient height above the roof as to be serviceable as well as providing for proper gas outlets, both as to location and size.

Much closer working arrangements must be brought about with the heating contractor. He can and will be of great assistance to us, if we work properly with him.

The speculative builder needs a plan whereby he can include heating in the houses he builds. This is possible in various ways and, if carried through properly on a sound policy, we will find that ultimately this type of builder will come to look upon heating equipment as being as necessary a part of the houses he builds as the foundation.

It is a big job we must undertake, so let us look at things for a moment, as they now exist. Central heating is confined to the higher priced homes. Can we be content with this? I do not think so, for these homes represent a small percentage of our true potential. The great majority of our customers live in homes of seven rooms or less, and most of them are of single story construction with absence of basements prevailing. Heating conditions in this average home are far from comfortable. Space heaters are generally used and frequently one encounters a heater with 20,000 B.t.u. input struggling away to heat a room 15x20 feet with 9-foot ceiling, three exposures, plenty of glass and perhaps a surplus of outside doors with windows and doors leaking cold like a sieve, and as for wall infiltration, the less said the better. Now what happens? Cold floors, condensation on walls, ceiling and windows, frequently to such an extent that water drops to the floor and forms into ice.

Do not infer that this illustration is in condemnation of space heating, for such is not the case. Space heating, properly applied, affords very satisfactory and economical heating, but those selling space heaters must remember that rooms do vary in size as well as the capacity of heaters, and see that the heaters they sell are adequate to meet the demands that will be put upon them.

In my estimation, the Southwest presents a most wonderful field for central heating, but to develop it, we must get out of the beaten path. We must use vision; yes, even a few "pipe dreams", by someone with initiative, courage and the backing of his company to carry these dreams out, would assist us wonderfully. As it now stands, our house heating stops where it should really be starting, and the excuse we make to ourselves in this is we can go no further for there are no basements.

The Basement Problem

We need not stop for lack of basements. If there is no basement, let us get along without it, but let us heat these homes properly just the same. Why not take our furnace into the attic, place our cold air registers in the floor and our warm air outlets in the ceiling. This, of course, requires a fan, but with the silent fans available today, it affords no real obstacle. While we are about it, why not turn our heating plant a little farther upside down and introduce our cold air into the top of the furnace, taking it out of the bottom? Impractical or impossible, you say. Perhaps, but I doubt it. While we are getting a little wild, let us become even more so and stay out of the attic. Let us concoct a nice, trim, insulated case for our furnace and fan (or leave the fan in the attic), and place our heating plant at the rear of the house, carrying our hot and cold air ducts over and below or both below, as you may desire. Plants of this character could be installed at prices to compare very favorably with basement installations.

Construction with heat inlets in the ceiling and cold air returns in the floor can be developed into a very successful method of heat distribution. It is an established fact that with heated floors a much lower room temperature may be employed and still be very comfortable; with an overhead introduction system, the air travel is all toward the floor and more even temperatures are bound to be had at all room heights with a very noticeable reduction in ceiling temperatures.

Those who prefer radiator heat need not be deprived of it simply because they live in a one-story home. The boiler can be placed in a small room or on the back porch at floor level and the flow line carried above the ceiling with a return line under the floor. This provides a very satisfactory hot water system. It can be bettered considerably, though, by introducing a pump, no larger than those employed in the circulation system of most automobiles. Current consumption on such a pump is about equal to a 40-watt lamp, and when connected with the thermostat this makes an ideal forced circulation system.

Conversion Burners

The problems of our customers who already have heating systems installed in which other fuels have been employed, and who desire to change to gas, must be handled individually. A survey must be made to determine the condition of the system. Frequently, it is found that recommendations must be made and assistance given in putting the plant into proper shape, for it is absolute folly to hope to cure mechanical ills through the mere application of gas.

It is important to decide whether a conversion burner or a new boiler or gas furnace will best meet the customer's needs. This question will largely answer itself when the boiler or furnace condition is determined. If a complete replacement or extensive repairs are necessary, then, of course, the gas boiler or furnace is what is needed. If the unit is in good condition, however, a conversion burner should be used, as the difference in cost of the two pieces of equipment would not be justified. It would not be wise to recommend the more expensive installation unless the fuel saving would be sufficient to compensate.

The matter of selling a conversion burner to a customer who already has a make-shift burner of some sort must be approached with caution. If his burner is equipped with thermostat, it represents a considerable investment which we should hesitate to disturb, and the customer will be loath to take much of any loss. Where systems such as this exist, the matter is one for the house heating engineer, and not for a salesman. A salesman, left to his own devices on such a job, may succeed in causing a customer to become dissatisfied with his equipment, but still fail to sell him on investing in new equipment, or if he succeeds in selling him, actual operation may not reveal sufficient saving and satisfaction to the customer as to make him feel his expenditure has been a good one. Under such conditions, the customer if not lost, is dissatisfied and unintentionally or otherwise hurts us in our efforts to promote better heating.

A heating engineer is frequently confronted with such problems. Our procedure has been to go over the system carefully having such mechanical changes as may be necessary made, then by means of a portable flue gas analyzer, bring the job up to its best practical operating efficiency. After this has been done, the figures are compiled and an interview arranged with the customer. In this interview all facts are placed before him, and a full explanation given. At the same time, it is explained what additional saving might be expected through the installation of a modern conversion burner. It is left entirely to the customer as to whether a new burner be installed or he continue as is.

Our efforts should not overlook future possibilities of house cooling and as far as practical, heating plants should be laid out with the thought of its later incorporation.

House Cooling Future . . . . .

C. K. PATTON

General Commercial Manager
Texas Cities Gas Company

THE two (house heating and house cooling) go hand in hand and in the future when we speak of a central heating system we will refer to it as the air conditioning system, providing clean, circulated, humidified warm air in the winter and properly conditioned cool air in the summer, all through the use of gas.

This is what the heating trade is working to, and while to date the cooling and summer air conditioning are being obtained by what might be called substitute methods which do the work only partially, nevertheless, they lead us to the day when systems will be perfected and the cooling will be obtained as it can be by no other method than with gas as the generating fuel. Possibly this may be misunderstood. There may be other generating fuels but we do believe that when the system finally is perfected none of them will render the service as economically as it can be obtained through a gas generated cooling system or, should I better say, gas air conditioning system.

This is proved through an exhaustive investigation by the Research Committee of the American Gas Association which two years ago definitely determined that there were no such limitations to the use of gas heat energy for house cooling as there are when power energy is used for this purpose. Power energy is adaptable to cooling and dehumidifying buildings only by means of refrigeration but, unlike power energy, gas heat energy is also adaptable to heating adsorption materials directly, thereby utilizing a much cheaper cooling and dehumidifying cycle that has not been used up to the present time—showing again the superiority of gas over electricity. So after all the public is now being sold on the idea of proper air conditioning summer and winter through a central system generated by gas and the only thing that remains now is to perfect and simplify this gas cooling so that it may simply fall in line and take over its part of the air conditioning burden which already has been prepared for it. This is why alert gas men should promote the idea of heating and air conditioning through a central gas fired system.

It may be of interest to note that the three experimental domestic installations which now are in operation, or about to be placed in operation, vary in the fact that the units installed in the north are dehumidifying units only, while the Dallas installation is a combined dehumidifying and cooling unit.

All of them are still much in the experimental stage differing in this detail but similar, however, in that gas provides the basic generating energy. What will be the ultimate along this line remains to be seen. In the case of the Dallas installation, the air conditioning unit consists of a supply and return duct from each room, a steam boiler and an Air-O-Fin heater for providing heating in the winter, a Silica-Gel adsorption cooling and dehumidifying unit, an air filter, and a blower for providing forced air circulation.

Although the system now installed in Dallas uses a gas-fired steam boiler as a means of providing heat for winter heating, as well as summer cooling, we believe it is possible to use the same system with a gas-fired warm air furnace for winter heating and a separate gas burner and heat exchanger using the products of combustion to provide the necessary heat to reactivate the Silica-Gel unit.

Planning for Future

The foregoing leads us to the conclusion that we should now plan for the future by recommending and installing central heating plants of the forced air type with inlet and return registers in each room. We should figure our duct sizes ample to stand an increase in velocity for cooling purposes. Thought should be given to basement space and a basement room of ample size should be included in the house plans. The basement room used in the Dallas installation measures 13 feet by 24 feet with a 7-foot clear ceiling, although an 8-foot ceiling would be preferable.

The adaptation of a cooling unit to the present gravity warm air installation with one central return using the installed ducts and registers is a problem yet to be solved by trial installation and is a question we cannot answer now.

At present it is apparent that the first cost of the present system would limit its market possibilities; also we hesitate to hazard an opinion as to the cost of operation of a cooling system. The only data we have available are the results of the Silica-Gel air conditioning system installed and operated during September of this year in the Dallas Gas Co. building, which are not applicable to a residence installation. Inasmuch as the factors of cost of installation and cost of operation are of primary importance to the subject of market possibilities for house cooling, we have little information of practical value. However, to proceed on such a premise that this represents what we can expect in the future would be indeed erroneous. From the present systems there will be developed more simple and less expensive systems and sufficient data will be available from the present experiments that eventually we will see, we believe, in the not distant future, adaptations of the principles now being promoted which will greatly broaden the market for house cooling with gas, making available outstanding features of comfort provided through the use of this system and this fuel. I look to see the day when even the more moderate homes will find the cost of summer cooling within the realm of the average income.

Industrial Competition . . . . .

JAMES A. BELL

Supervisory Commercial Manager
The Kansas Pipe Line & Gas Company
Salina, Kansas

RAPIDLY changing economic relations between competitive fuels have brought about a condition which merits very careful study and consideration on the part of those responsible for holding and developing the industrial gas load. Never before has competition been more severe than during the past few months. The advent of natural gas introduced to thousands of communities during the past three or four years has caused painful losses in the sales volume to the coal and oil interests and it is only natural that they should take advantage of present conditions to try to regain what they have lost.

Utility companies during the past few years have swept competition off of its feet by organized and aggressive sales

(Continued on Page 43)

Use *of* Ethyl Mercaptan *to* Locate Leaks *for* Coast Counties

By A. R. BAILEY
Gas Engineer
*Coast Counties Gas and Electric Company**

THE use of special intensive odorants for the detection of gas leaks is by no means new. As early as 1880 we find records disclosing the introduction of special odorants into water gas in Germany. Other attempts were made in Europe during the latter part of the nineteenth century, but apparently little was done in this country until 1919 when various mercaptans were used in Kansas City. Since then considerable research work has been done by the United States Bureau of Mines. The writer wishes to gratefully acknowledge the assistance obtained from the "United States Bureau of Mines Report of Investigations No. 3007" and "Bureau of Mines Monograph No. 4."

A. R. Bailey

In view of the above it will be seen that there is nothing original about the use of Ethyl Mercaptan for gas leak detection, but it is believed that the conditions under which it was used by our company were somewhat different. In most other places where Ethyl Mercaptan was used the gas had not been previously ordorized, while in our system all gas has been odorized since the introduction of natural gas with Cal-odorant, concentration three to four gallons per MM.c.f. This Cal-odorant has been particularly satisfactory in disclosing leaks on customer's premises and has the distinct advantage over Ethyl Mercaptan of having a characteristic "gas" odor, and is not obnoxious or nauseating.

Early in 1931 unaccounted-for gas in several of our towns had increased to the point where the loss of gas became a serious problem. In order to keep the costs of leakage mitigation down to a minimum, it was decided to inject Ethyl Mercaptan into a few of the distribution systems for a short period of time.

The first town odorized with Ethyl Mercaptan has a population of approximately 10.000 with an average of 1850 meters. Unaccounted for gas had been running about 2500 M.c.f. per month or approximately 35 per cent of the total sendout. Some previous leakage survey work had been done on the system and it was supposed that all major leaks had been eliminated.

After considering the experiences in other cities when gas odorant was first injected, it was expected that for the first few days after injecting Ethyl Mercaptan, there would be a considerable increase in the number of complaints caused by small leaks around consumers' equipment. To meet this condition it was decided to use a smaller quantity of Ethyl Mercaptan for the first few days and repair leaks in customers' equipment before increasing the concentration needed for underground leak detection. The first three days Ethyl Mercaptan was injected at the rate of 10 pounds per MM.c.f. and the following two days at the rate of 15 pounds per MM.c.f., giving a total of five days with the lighter concentrations. Within two hours after the introduction of Ethyl Mercaptan we received the first leak complaint and by the end of the first day about 50 complaints had been received, and continued to be received until the injection of Ethyl Mercaptan was discontinued. These leaks were mostly small leaks around appliance unions and stop cocks, although about 20 per cent were around meter and regulator connections. A few of the reported leaks were found to be due to customer's turning on the gas a few seconds before lighting it, and consequently unburned gas passed into the room. No underground leaks were found during the five days injection of Ethyl Mercaptan at light concentrations. This is of particular importance as it influences the decision on whether or not to use light concentrations.

On the sixth day the concentration was increased to 50 pounds per MM.c.f. and continued for two days. During this time men were detailed to patrol the streets, smelling service risers, manholes, water meter boxes and catch basins. Some 30 underground leaks were located in this way, 25 of which were minor leaks around service connections and saddles. The remaining five leaks were in mains and services corroded through and were of considerable importance. Some of the leaks around service clamps were relatively small, which indicates the effectiveness of Ethyl Mercaptan in disclosing sub-surface leaks. No further street leaks were located toward the end of the second day so the odorant was discontinued to reduce the number of complaints from consumers. The receipt of leak reports on consumers' premises fell off within a few hours after the injection of odorant was discontinued.

It is of interest to report that in a number of cases the customers were somewhat annoyed by the use of this odorant, but when our men explained that it was a temporary condition and to their advantage, the consumers seemed to appreciate our efforts. In most of these cases the consumers were glad to have the leaks located and repaired, and our public relataions were in no way injured by the few days annoyance to customers. Some amusing incidents were reported by our men responding to complaints. Several women stated that they thought a rat had died under the house and had their husbands make an inspection. One woman had decided a chicken she was roasting was putrid, while still another had requested her husband to bathe. In spite of these cases the customers were friendly.

Summarizing the activities in this one town we have the following:

Total days odorant used	7
Rate of odorant injections:	
3 days	10 lbs per MM. c.f.
2 days	15 lbs. per MM. c.f.
2 days	50 lbs. per MM. c.f.
Number of meters	1850
Total number of leaks	340
Main leaks	5
Service leaks	25
Meter and regulator leaks	72
Appliance and piping leaks	238
Unaccounted-for prior to test	2,500 M.c.f. per month
Unaccounted for after odorant test	1,000 M.c.f. per month

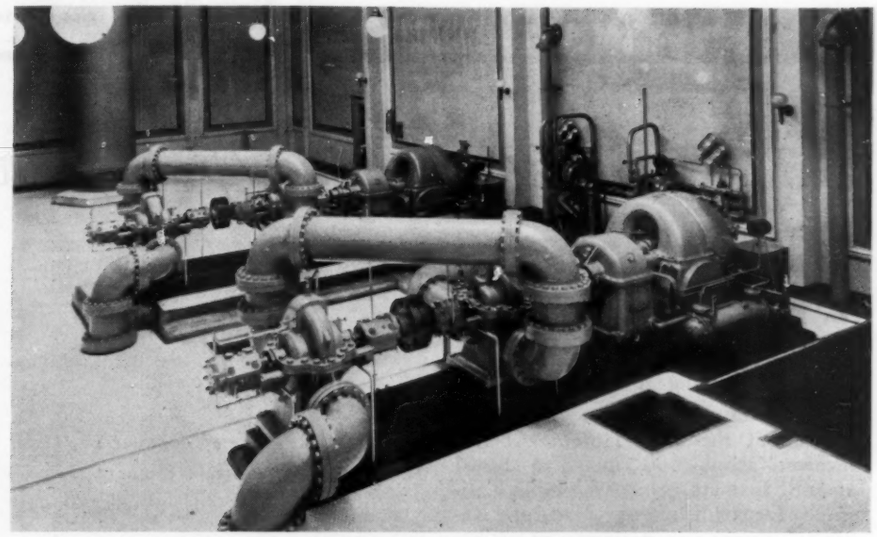
The second town odorized has a population of approximately 7000 with an average of 1050 meters. Unaccounted-for gas had been averaging about 2000 Mc.f. per month or approximately 40 per cent of the sendout.

(Continued on Page 56)

*Presented before the Pacific Coast Gas Association conference at San Francisco, November 19-20, 1931.

Steam Plants *for* Water Pumping Use Gas

By W. W. GERMAN
Industrial Gas Sales
*Pacific Gas and Electric Co.**



Pumping units in the San Francisco Water Department's Central Station, one of the most modern steam pumping plants on the department's system. Three 150-H.P. boilers fired by natural gas are a part of this installation.

DURING the last year in northern California there has been a considerable increase in the use of gas fuel in steam plants for pumping water. The flexibility, overload capacity, and economy of operation and maintenance possible with gas firing, has made a strong appeal to operators in this district, and dependable equipment correctly applied, has brought about a growing consumer acceptance and satisfaction.

In this connection a review of the installations and practices of the municipal plants of San Francisco may be of value to those who are interested in actual results obtained with gas fuel in steam pumping plants, particularly those performances which result from ordinary, every day service, and which may be duplicated with little effort in any steam pumping plant.

W. W. German

On March 3, 1930, the pumping plant near Belmont, which at that time was still the property of the Spring Valley Water Co., commenced the use of gas. This plant, with a total installed boiler rating of 1300 H.P., is fired with 12 Type 4-AX Webster radiant gas burners governed by a wilgus fuel regulator, and has a pumping capacity of 16,000,000 gallons of water per day. The performance of this plant, and the marked economies in fuel cost and maintenance effected through the conversion to gas, rendered the task of converting the Milbrae plant, the Lake Merced plant, and the Central Pumping Station, located at 19th and Sloat Boulevard, S. F. much easier. Consequently in rapid succession, the Milbrae plant on August 8, 1930, the Central Pumping Station on September 11, 1930, and the City Pumping Station at Lake Merced on November 5, 1930, were cut over to the use of gas fuel. The two latter plants are worthy of closer scrutiny inasmuch as they represent two different types of pumping practice.

The City Pumping Station is located on the shore of Lake Merced and pumps direct from the lake through filters, as well as boosting the water delivered from Lake San Andres. There are two separate pumping units, each of which has two horizontal, double acting plunger pumps driven by a cross-compound engine. Normally one of the units acts as a booster for San Andres water and the other handles water from Lake Merced. Steam for the engines is furnished by two of the three 150 H.P., H.W.T. boilers installed. In the actual conversion of these boilers the checker decks were removed and the side walls, thus exposed, were protected by 9 inches of firebrick. The floor, consisting of a course of insulating brick covered with 5 inches of firebrick was laid on 3 inch hollow tile, manifold just forward of the bridge wall, and receiving air from an opening in the side wall of the boiler. The air, drawn in here traveled forward through the tile, and was discharged up through the floor at the face of the burners. Two Natural Gas Equipment Company Type "A" burners were installed in the existing ashpit doors of each boiler, and the gas supply to them controlled by 3-inch Wilgus gas fuel regulator set to maintain 125 pounds per square inch steam pressure. Details of the installation may be seen in the illustration. For the purposes of this article data were taken from the daily log sheets kept by the engineer in charge of the plant and no attempt made to "choose" a particularly efficient run, nor were test conditions attained. After the data for oil had been secured, the same type of data were abstracted from the log for gas firing, the only condition being to secure data for a day in which practically the same amount of water had been pumped. The results are given below and show the station duty or the overall results obtained. It should be noted here that station auxiliary losses (air pumps, station lighting generator, blowdown, etc.) are present and are absorbed in the duty; hence the results give a true and complete picture of overall station performance.

Oil Fuel

January 3, 1930. 24 hour period.
Water pumped:
San Andres—3,512,416 gallons.
Lake Merced—3,375,616 gallons.
Work done:
San Andres—9,450,471,275 foot-pounds.
Lake Merced—14,565,580,358 foot-pounds.
Total work done: 24,016,051,633 foot-pounds.
Duty: 11,139,000 foot-pounds per gal. of oil.

Gas Fuel

January 17, 1931. 24 hour period.
Water pumped:
San Andres—3,573,206 gallons.
Lake Merced—3,219,968 gallons.
Work done :
San Andres—9,614,032,015 foot-pounds.
Lake Merced—13,893,968,494 foot-pounds.
Total work done: 23,508,000,000 foot-pounds.
Duty: 92,600,000 foot-pounds per 1,000 cubic feet of gas.

(Continued on Page 53)

* Now industrial gas engineer for Montana Power Co., Butte, Montana.

Pacific Coast Gas Association

Managing Director: Clifford Johnstone

Association Headquarters: 447 Sutter St., San Francisco

President: Jas. L. Stone

Vice-President and Gen. Manager, Spokane Gas and Fuel Co.

1932 Organization Set Up at November Conference

THE Accounting, Commercial, Public Relations, and Technical Sections participated in the Organization Conference of the Pacific Coast Gas Association held in San Francisco, November 19 and 20. Each section held individual meetings, joining together in a luncheon at the Clift Hotel. At this luncheon about 100 members heard James S. Bennett, attorney for the California Department of Natural Resources, discuss the conservation of gas and oil. Mr. Bennett went briefly into the history of oil and gas in California and the causes which led up to the passage of the State Conservation Act in 1929. By agreements among operators and other means the waste of natural gas has since been materially decreased. Many problems still remain to be worked out as soon as possible after the constitutionality of the Act is passed upon by the Supreme Court. The luncheon gathering was also briefly addressed by A. F. Hockenbeamer, president of Pacific Gas and Electric Co., who expressed himself optimistically in regard to the business situation. The closing address dealing with the relations between utility and retail dealers was made by F. M. Banks, general superintendent of sales of Southern California Gas Co., and chairman of the Commercial Section, Pacific Coast Gas Association. Entertainment was furnished by Miss Del Perry at the piano and Johnny O'Brien and his "educated" harmonica.

At the section and committee meetings, the organization of the year's program of study was practically completed, although in some cases the membership of committees remains to be filled out.

Accounting Section

C. D. Cushman, chairman, announced the appointment of R. N. Dreiman, treasurer of the Standard Management & Operating Corp., as vice-chairman, Central Region.

Commercial Section

The program of the Commercial Section is well underway. J. C. Gilbert, chairman of the Domestic Sales Committee, announced the following organization. This may be expanded somewhat during the next month.

Vacuum Heating Systems

A paper by John Fremont, British Columbia Electric Power and Gas Co. To be read at the Spokane Convention.

Load Value of Appliances

H. W. Geyer, chairman, Southern Counties Gas Co.
L. J. Brundige, Pacific Gas and Electric Co.
W. P. Hand, Southern California Gas Co.
J. S. Holt, Seattle Gas Co.
C. R. Miller, Portland Gas & Coke Co.
D. H. Perkins, San Diego Consolidated Gas and Electric Co.
L. C. Rausch, Montana Power Co.

Air Conditioning

H. L. Warren, chairman, Southern California Gas Co.

Market Survey

H. E. Davidson, chairman, Southern California Gas Co.

Promotional Sales

H. M. Wilcox, chairman, Southern Counties Gas Co.

Promotional Domestic Rates

E. H. Wetlaufer, chairman, Southern California Gas Co.

Liquefied Gas

H. L. Farrar, chairman, Standard Management & Operating Corp.

E. M. De Remer, chairman of the Industrial Sales Committee, reported the following studies:

Industrial Data Sheets

E. J. Strickland, chairman, Southern California Gas Co.
E. H. Adler, Montana Power Co.
Herbert Haas, Pacific Gas and Electic Co.
L. C. Haffner, Portland Gas & Coke Co.
R. J. Phillips, San Diego Consolidated Gas and Electric Co.
James Thompson, British Columbia Electric Power and Gas Co.
Ray Trowbridge, Seattle Gas Co.

Hotels and Restaurants

D. H. Leahy, chairman, Southern Counties Gas Co.

Heat Treating

Jas. H. Knapp, president of the Jas. H. Knapp Co., and Geo. Bowersox, Natural Gas Equipment, Inc., will be responsible for securing adequate papers on this subject for the Spokane Convention.

Natural Gas Conversions

K. B. Anderson, chairman, Coast Industrial Gas Co.

Gas Engines

W. F. Suess, chairman, Southern California Gas Co.
E. W. Epperson, Western Enterprise Engine Co.
J. W. Reed, Cooper-Bessemer Co.
Chas. Remschell, Southern Counties Gas Co.

Industrial Gas Competition

F. C. Dietrich, chairman, Pacific Gas and Electric Co.
H. H. Foreman, Southern California Gas Co.
Chas. Robert, Los Angeles Gas and Electric Corp.
C. H. Webber, Tucson Gas, Electric Light & Power Co.

In addition to the above F. M. Banks, chairman of the Commercial Section, announced that the Committee on Architects and Contractors Manual would be continued under the leadership of F. L. Moon, Los Angeles Gas and Electric Corp.

Order Proceedings Now!

VOLUME 22 of the Pacific Coast Gas Association Proceedings, covering reports submitted during the fiscal year 1930-1931, will be ready for mailing about the first of the year. Notices were issued during November to inform the membership that the current copy of the Proceedings would be sent only to those who request it. There will be no charge to members for the book, but in the interests of economy it will be mailed only to those who have returned the postcard order blanks provided for the purpose. These should be sent to the Association offices not later than December 20.

Public Relations Section

In addition to the appointments reported on this page in the November issue, Geo. L. Myers, Chairman of the Public Relations Section, announced the following appointments:

Employees' Welfare

B. H. Parkinson, chairman, Portland Gas & Coke Co.

Customer Ownership

E. J. Beckett, chairman, Pacific Gas and Electric Co.

Customer Relations

J. F. Pollard, chairman, Seattle Gas Co.

D. L. Scott, chairman of the Employees' Education Committee, held a meeting of his committee in connection with the Conference. It was decided to proceed immediately with the preparation of a text for an elementary course on public utility economics. This text will cover such subjects as a history of the gas industry, regulation, taxation, finance and private and government ownership. The membership of the committee is as follows:

D. L. Scott, chairman, Los Angeles Gas and Electric Corp.
F. H. Bivens, Southern Counties Gas Co.
R. R. Blackburn, Southern California Gas Co.
F. V. Boller, San Joaquin Light & Power Corp.
Clifford Johnstone, Pacific Coast Gas Association.
Alfred May, San Diego Consolidated Gas and Electric Co.
Geo. L. Myers, Portland Gas & Coke Co.
J. F. Pollard, Seattle Gas Co.
D. C. Ray, Pacific Gas and Electric Co.
Clarita Scott, Los Angeles Gas and Electric Corp.
J. L. Stone, Spokane Gas and Fuel Co.
W. D. Thurber, Southern Counties Gas Co.
C. T. Yates, Arizona Edison Co.

Technical Section

D. H. Perkins, chairman of the Technical Section, announced the appointment of C. P. Johnson, Puget Sound Power & Light Co., as chairman of the Production Committee. Studies to be made by the Production Committee include "Maintenance of Stand-By Plants," Frank Wills, Pacific Gas and Electric Co., chairman; and "The Effect of Sulphur Dioxide on Vent Pipe and Plant Corrosion," M. T. Burton, Southern California Gas Co., chairman.

Guy Corfield, chairman of the Distribution Committee, announced the following organization:

Servicing of Special Installations

W. F. Pape, chairman, Pacific Gas and Electric Co.

Accident Prevention

R. R. Blackburn, chairman, Southern California Gas Co.
J. Barrington, Coast Counties Gas and Electric Co.
S. C. Dickinson, Pacific Gas and Electric Co.

Distribution Design

Norman Hoff, chairman, Los Angeles Gas and Electric Corp.
R. U. Fitting, Los Angeles Gas and Electric Corp.
D. B. Larson, Portland Gas & Coke Co.
R. E. Many, Los Angeles Gas and Electric Corp.
E. H. Mohr, Los Angeles Gas and Electric Corp.

Storeroom and Toolroom Methods

C. D. Weiss, chairman, San Diego Consolidated Gas and Electric Co.

Governors and Regulators

W. A. La Violette, Pacific Gas and Electric Co.

Domestic Meters

D. E. Farmer, chairman, Portland Gas & Coke Co.

Pipe Protection

O. L. Wrestler, chairman, Los Angeles Gas and Electric Corp.
C. P. de Jonge, San Diego Consolidated Gas and Electric Co.
Chris Goldkamp, San Diego Consolidated Gas and Electric Co.

Frank C. Packer *C. L. Ferguson*

Packer Sales Mgr. for Welsbach; Ferguson Takes Pac. Coast District

FRANK C. PACKER, Pacific Coast district manager for Welsbach Co., left California on November 18 to take up new duties as general sales manager for Welsbach, effective November 23, with offices at company headquarters, Gloucester City, N. J.

Mr. Packer succeeds Jack McCay, whose sudden death from heart failure on November 12 came as a shock to his many friends of the industry.

Mr. Packer leaves a wide circle of friends in the Pacific Coast gas industry, his appointment following more than 26 years of service to his company on the Coast. Starting in 1905 in the stock room of the Pacific Coast department offices at San Francisco, he served next as manager of the San Francisco retail store, in 1906. In 1908 he became traveling sales representative, his territory gradually increasing until it included seven western states, British Columbia, and Hawaii. In 1929 he was made district manager for the Pacific Coast.

During his period of work on the Coast Mr. Packer has been active in the Pacific Coast Gas Association and American Gas Association, this year holding the office of vice-chairman of the P.C.G.A. Commercial Section. He contemplates frequent trips to the Coast in the interest of his company.

Charles L. Ferguson, who has been associated with Mr. Packer for the past year and a half as sales representative, has been named acting district manager for the Pacific Coast.

Ray Edwards Safety Director for San Diego Consolidated

Announcement was made late in October of the appointment of Ray Edwards as safety director for the San Diego Consolidated Gas and Electric Co., San Diego, Calif. The post is newly created. In general the safety director's duties will be to supervise and direct all accident prevention activities, to receive suggestions for the elimination of unsafe conditions and methods, to inspect the company's plants and equipment in the interest of safe working conditions and the elimination of hazards, and to investigate all accidents and to analyze them in order to prevent recurrences.

Mr. Edwards has served for the past 10 years as trouble clerk in the gas distribution department of the San Diego Consolidated Gas and Electric Co.

Ready to Begin Construction on Vancouver Gas Plant

Preparations are now being made by the B. C. Electric Railway Co.'s gas division for an immediate start on the construction of the retort house which will form part of the new gas plant to be constructed by the company at False Creek, Vancouver. Between 300 and 400 piles will serve as foundation for the retort house. Bids for the general contract will be called for at a future early date. Workmen are now making test drills for the foundation.

The retort house will be the largest unit in the $850,000 plant, construction of which was announced as contemplated by the company during the summer. Contract for manufacture and installation of all machinery and equipment has already been awarded.

Planning Sessions of Ariz. Utilities Assn., Tucson, April 13-15

The Arizona Utilities Association will meet in annual session at Tucson, Ariz., April 13, 14 and 15, 1932. Convention committees are already at work formulating plans and whipping program details into shape for the conclave, with the expectation that several officials of the American Gas Association and the National Electric Light Association will take part. Prominent among subjects will be public relations, commercial activities and women's committee work. Definite program details will be released in February, according to C. H. Webber, superintendent of the gas department of the Tucson Gas, Light & Power Co., and president of the Association, who is in charge of arrangements.

Los Angeles G. and E. to Double Capacity of Seal Beach Plant

Los Angeles Gas and Electric Corp., Los Angeles, is planning construction of a $3,500,000 addition to its steam plant at Seal Beach, Calif. Construction of this new unit will increase the plant capacity 50 per cent, and will increase the gas load in the same proportion. When the work is completed it will give the Seal Beach plant a total capacity of 150,000 H.P. Construction is expected to begin the first of the year.

Regional Meetings to Advance Section Program for A. G. A. Manufacturers

THE new group activities of the American Gas Association Manufacturers Section are being accorded a high order of interest and cooperation from gas appliance manufacturers throughout the country, with many requests being received at A.G.A. headquarters for the manager of this work to attend state and sectional meetings to explain the purposes behind this recently established complete trade association service for the manufacturers. A meeting of this nature was held on the Pacific Coast and addressed by the association manager of group activities, Philip O. Deitsch, on December 1 at Los Angeles. A similar meeting is being held at San Francisco, December 3. A third meeting of this same type is to be held at Nashville, Tenn., on December 7, when Mr. Deitsch will address the Southern Association of Manufacturers for the purposes outlined above.

At the Los Angeles meeting R. L. Hinckley, president of the General Water Heater Corp., was elected chairman of the Pacific Coast division, with H. W. Jackson, manager of the James Graham Manufacturing Co., San Francisco, as vice chairman.

It is expected that this election will be ratified at the San Francisco meeting, December 3, which is convening as *Western Gas* goes to press.

The Los Angeles meeting also determined upon an organization committee of eight, four members to be appointed in southern territory and four members from northern territory. Southern members of the organization committee elected were P. J. O'Keefe of the O'Keefe & Merritt Co.; El Roy Payne of Payne Furnace & Supply Co.; W. J. Bailey, of the Day and Night Water Heater Co; and J. M. Williams, Williams Radiator Co. Mr. Williams was made chairman of the organization committee, subject to ratification at the San Francisco meeting.

This committee was empowered to draft a plan of organization for the Pacific Coast division which would tie in with the work of the American Gas Association's Manufacturers Section. The committee was also authorized to negotiate with the Pacific Coast Gas Association, with reference to making the Pacific Coast division a section of that association.

Among the several activities which are being undertaken in this new work are Standards of Practice, whereby each branch of the industry will codify and establish for itself certain standards of ethical business conduct. Already these standards have been adopted by the Space Heater, Water Heater and Range Divisions of the Association. It is because of the great potential good that can be reflected to the gas industry generally, that much interest is being manifest in this particular branch of the new work by utility companies as well as dealer organizations and the manufacturers.

Another important activity which has been discussed in past sessions and is being considered at this time is the cross licensing of patents, which arrangement is designed to eliminate costly and time consuming litigation from within the ranks of the industry.

Under this arrangement, patents of manufacturers will be evaluated and exchanges of the right for the use of these patents will be made from one manufacturer to another for royalties to be stipulated by an evaluation committee, which will also serve in the event of disputes as an arbitration committee.

Other features of the work consist of the compilation and dissemination of accurate statistical data, the protection of the interests of the industry, when safety ordinances are being considered by various municipalities and in short, such other trade association service for the manufacturing members of the American Gas Association.

At the annual meeting of the Manufacturers' Section, which was held in Detroit on September 17 and 18 last, the largest gathering of manufacturers ever assembled at one time took place and there unanimously ratified the new program.

Therm Rate for Gas Service in Seattle

THE Seattle Gas Co., Seattle, Wash., announced on November 7 that beginning November 16 the company would offer its patrons a new, low "th-rm" rate for gas. Company officials stated that the new rates will save gas customers up to 30 per cent on their present gas bills varying with the kind and types of gas equipment they are now using.

This is the second time within 15 months that the company has asked the State Department of Public Works for permission to file reduced tariffs. Company rate engineers estimate the total saving possible for present gas customers under these new therm rates will be $100,000. The new rates are optional and customers will be billed under them only at their own request. Between November 7 and November 16 the company carried on an advertising campaign, featuring full-page advertisements with the new therm rate as the central theme.

Previous to the inauguration of the new plan, tests were made by scientists from the University of Washington and the Washington State Normal School in which the gas company had no part. The cases were figured on the utility uses of typical families, with the result that savings of from 21.7 to 11.9 per cent were estimated for gas consumption under the new therm rate, as compared with other fuels at existing rates.

The unit adopted in these schedules is 1/10 therm, or 10,000 B.t.u.'s. This is approximately three times as much heat as is contained in a kilowatt hour of electricity, the latter being 3412 B.t.u.'s.

The schedule for domestic consumers calls for a monthly charge of 75 cents for 25 units or less. The next 75 units will be billed at 2.8 cents per unit; the next 150 units at 2.6 cents per unit and all over 250 units at 2.1 cents per unit. For water heating, refrigeration and space heating service the first 150 units will be billed at 1.6 cents per unit and all over that amount at 1.4 cents. The heating service schedule steps from 1.5 cents per unit for the first 200 units to 1.0 cents per unit for all over 500 units, and the commercial gas service schedule steps from 2.0 cents per unit to 1.0 cents per unit.

Captain A. E. Higgins Secretary Natural Gas Department

EFFECTIVE December 1, E. J. Stephany has resigned as secretary of the Natural Gas Department, according to word received late last month from the American Gas Association. Captain A. E. Higgins, who for the past several years has handled the work of field representative for the A.G.A., has been appointed secretary, with headquarters at Dallas, Texas, where offices of the Department have been maintained for some time.

Captain Higgins in connection with his duties as field representative has traveled extensively in all natural gas territory, and through his wide personal acquaintance and close knowledge of natural gas problems, should render excellent leadership in Natural Gas Department activities.

Changes in District Office Personnel of So. Cal. Gas Co.

D. U. Wheaton, formerly sales supervisor of Southern California Gas Co.'s Northern Division, headquartered at Glendale, has been transferred to company headquarters at Los Angeles, where he will engage in dealer contact activities. Paul C. Hargrave, sales supervisor in Southern Division headquarters, Redondo Beach, has taken Mr. Wheaton's place at Glendale, and O. M. Butler, salesman at Van Nuys, has been transferred to Redondo, taking Mr. Hargraves' place. O. D. Smith will occupy the position formerly occupied by Mr. Butler at Van Nuys.

Now Called Northern Gas and Pipe Line Company

Announcement was made in November of the change in name of the Missouri Valley Pipe Line Co., of Omaha, Neb., to the Northern Gas and Pipe Line Co. The company is the construction unit of the Northern Natural System.

1931-32 Calendar

December

Eleventh Annual Gas Meter Short Course and Conference—Under joint auspices of Mid-West Gas Association and Iowa State College. Ames, Iowa, December 8-11, 1931.

Southern California Meter Association—Los Angeles, California, December 17, 1931.

April

Arizona Utilities Association—Annual Convention, Tucson, Ariz., April 14-15, 1932.

Missouri Association of Public Utilities—Annual convention, April 28, 29 and 30, 1932.

September

Pacific Coast Gas Association—Annual Convention, Spokane, Wash., September, 1932.

October

American Gas Association—Annual Convention, week of October 12, 1932, Atlantic City, N. J.

Laclede Scheduled to Serve Mixed Natural and Manufactured

The Laclede Gas Light Co., St. Louis, Mo., is reported to have completed arrangements for serving mixed natural and manufactured gas in St. Louis for domestic use, according to statements in the press of the district credited to Harley L. Clarke, president of Utilities Power & Light Corp. of Chicago, parent organization of Laclede. The company, according to this statement, will secure its supply from the Mississippi River Fuel Corp.'s line now serving St. Louis industries.

Possibility of a second line from the Monroe field to St. Louis is also mentioned in press reports, which state that Mississippi River Fuel Corp. has already made preliminary surveys for the second line, which would parellel the first.

New rate schedules are being worked out by Laclede Gas Light Co., and will be filed with the Missouri Utilities Commission when they are completed.

Drumheller Line Plans Form; Ask Permit to Construct Carrier

Press dispatches from the Northwest state that plans for a natural gas transmission line from the Cut Bank field in Montana to Spokane and points on the coast are being further prosecuted by Jerome K. Drumheller of Spokane. Permission has been asked the Idaho Utilities Commission for a certificate of convenience and necessity to permit the construction to begin in 1932, the petition stating that the remainder of 1931 is needed for securing franchises and rights-of-way in the territory.

If Mr. Drumheller's plans are carried out, the line will originate in Cut Bank field, Mont., and might tap Canadian fields just across the border. The line would enter Idaho just east of Burke and extend in a westerly direction to Spokane, and later probably would serve Vancouver and Seattle, Wash.

Lewistown Natural Proceeding With Line Construction

Construction of the Lewistown Natural Gas Co.'s line from the Armells structure north of the town is well under way, with Skaggs Construction Co. of Fort Worth holding the general contract. The company expects to begin serving Harlowtown, the most southern point, before heavy winter weather sets in. Towns to be served include Hanover, Lewistown, Moccasin, Moore, Judith Gap and Harlowtown.

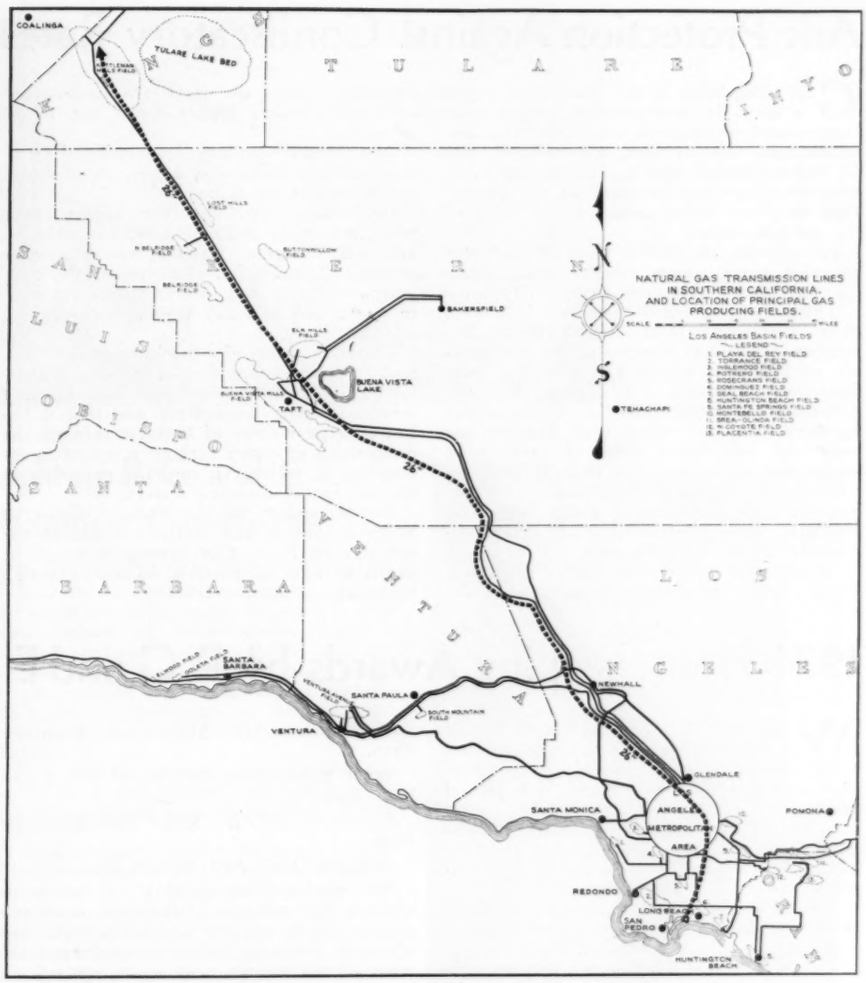
Later a system is to be constructed from the Arrow Creek structure to Coffee Creek, Denton and Stanford, and it is possible that the two systems may eventually be connected.

Jos. Staples, Jr., Is Asst. Secy.-Treas. for Empire Public Service Co.

Joseph A. Staples, Jr., has been appointed assistant secretary and treasurer of the Oklahoma and Kansas properties of the Empire Public Service Co., which operates the Oklahoma Utilities Co., the Southwest Production Co., the Southwest Pipe Line Co., and the Caney Electric Co. Mr. Staples is a native of Richmond, Va., and comes to Oklahoma from Virginia and North Carolina properties of the Empire Public Service Co., where he was auditor.

Plans to Serve Villas, Colo.

Colorado Gas & Utilities Co., Denver, Colo., plans construction of a line to serve Villas, Colo. Supply will come from the company's line originating in the Hugoton, Kan., field.



Map showing natural gas transmission lines in Southern California, location of principal gas fields, and the route of the Southern Fuel Co.'s newly completed carrier, indicated by the heavy broken line.

Southern Fuel Co.'s Line Completed

CONSTRUCTION of Southern Fuel Co.'s 213-mile, 26-inch carrier from Kettleman Hills to Long Beach, Calif., begun in April, was announced as completed early in November. Present capacity of the line for delivery in Long Beach and Los Angeles is 130,000,000 cubic feet daily, which can be increased to 200,000,000 by the addition of compressor facilities.

Southern Fuel Co. was organized by the Southern California Gas Co. and the Southern California Edison Co., Ltd., for the purpose of constructing this major line, and a large portion of the gas will be consumed in the Southern California Edison Co.'s steam plant at Long Beach in the generation of electricity. Capacity of the line is about one-third of the total amount of gas handled in the Los Angeles metropolitan area before construction of the carrier, and in addition to supplying the major requirements of the Long Beach plant, the line will also supply domestic and industrial consumers in Los Angeles. Cost of the development is estimated at about $6,500,000.

The January issue of *Western Gas* will carry an engineering review of construction operations on the new carrier.

Seventeen Towns Added to Northern Naturals' System in Nov.

Seventeen towns on the Northern Natural Gas Co. system received gas in time for cooking Thanksgiving dinners. In Nebraska, Wayne, Wakefield, Emerson, Pender, Valley, Waterloo and Elkhorn, were added to the list of natural gas towns, while in Iowa, Glenwood, Avoca, Audubon, Exira, Boxholm, Pilot Mound, Dayton, Harcourt, Gowrie and Farnhamville received natural gas for the first time.

Norborne, Mo. Now on Natural Gas; Gillespie in Charge

A pipe line was recently completed by Cities Service Gas Co. to Norborne, Mo., from a point just south of Carrollton. Ozark Distributing Co. completed the distribution system some time ago. W. A. Gillespie, sales representative of the Ozark Distributing Co., Cities Service subsidiary, will spend some of his time in Norborne, where about 165 homes have been connected with the company's mains.

Ask Protection Against Confiscatory Rates

GAS companies in the Southwest began a move in November to protect their service and property against arbitrary and confiscatory rates by filing a number of suits in Federal courts and by introducing ordinances asking rate increases on the ground that they are losing money under some of the existing rates.

In addition to this a number of towns repealed their recent rate reduction ordinances. Among these was Saint Jo, Texas.

The first of the suits was filed in United States District Court at Abilene, Texas, November 2, and was directed at the city council of Eastland, which had passed a rate reduction ordinance. Claiming that the Community Natural Gas Co., which serves Eastland, had lost more than $12,000 last year and had fallen short of earning its authorized return by more than $30,000, attorneys for the company secured from the Federal court a temporary order restraining Eastland from interfering with the establishment of an adequate rate.

Similar suits were filed against Cameron, Royse City and other towns where the company alleges the rates are confiscatory. In each instance higher rates are to be asked.

The Federal Court at Waco ordered Cameron to show cause why higher rates should not be established there.

Ordinances providing for higher rates were introduced at Royse City, Farmersville, Garland, Cameron, Dawson, and a number of other Texas cities. Officials of the company announced that similar ordinances were to be offered in cities where rates are not adequate.

Chester L. May, vice-president of the Community Natural Gas Co., addressing a number of city councils, stated that the company's service is being jeopardized and that it has lost a large volume of business through the competition of cheap fuel oil supplied to industries, as well as a constant reduction in the number of domestic meters.

On November 18 the Federal Court at Wichita Falls, Texas, declined to dismiss the suit against Royse City, stating it would be heard as soon as possible without granting temporary injunctive relief.

1931 Housekeeping Awards by P. G. and E.

W. S. YARD, vice-president of Pacific Gas and Electric Co., San Francisco, Calif., in accordance with the merit plan and system of awards established several years ago for the encouragement of better maintenance of properties in the several districts, has announced awards for the year 1931, as found by the General Rating Committee, as given in the table below.

Besides the prize winning properties listed there are six other properties that received a rating about 95 per cent. These were:

Monterey—Class "B" Meter and Regulator Shop.

Roseville—Class "B" Meter and Regulator Shop.

Napa—Class "B" Meter and Regulator Shop.

Santa Rosa—Class "B" Meter and Regulator Shop.

Eureka—Class "B" Meter and Regulator Shop.

Oakland—50th Ave. Holder Station.

The combined rating of all of the properties is 86.7 per cent of the total obtainable points. There were 27 properties that rated above 90 per cent. The continued improvement of the gas properties is quite evident under the operation of the P. G. and E. "good housekeeping" system.

Prize Properties

Property—	*First*	*Second*	*Third*
Production Plants	San Rafael	Stockton	Vallejo
Holder Stations	Petaluma	Santa Rosa	Chico
Meter and Regulator Shops—			
Class "A"	San Rafael	Marysville	San Jose
Class "B"	Salinas	Redding	Petaluma

Hollister Patrol Station is the prize property of the Natural Gas Compressor and Patrol Stations.

Premium Property of Respective Sections Regardless of Class

Northern Section.....Marysville—Class "A" Meter and Regulator Shop
Central Section.....San Rafael—Class "A" Meter and Regulator Shop
Southern Section.....Salinas—Class "B" Meter and Regulator Shop

Utah Natural Gas Companies Hold Employee Meeting

More than 400 employees of the Utah natural gas companies met in conference at the Utah Gas & Coke Co.'s auditorium in Salt Lake City on November 5, and were addressed by L. Fitzpatrick, vice-president and general manager of the company; J. D. Roberts, operating vice-president; L. H. Stratford, domestic sales manager, and L. D. Simmons, director of public relations and advertising. Mr. Simmons presided at the meeting. Company policies were outlined, and an employee contest plan for load building was announced. Rate reductions for the company were explained to the employees as effecting a saving of from 14 to 16 per cent in the bills of the average consumer.

C. L. Bullock, President of Wichison Industrial Gas Co., Dies

C. L. Bullock, president of the Wichison Industrial Gas Co., of Wichita, Kan., died on October 16, following a month's illness. Mr. Bullock was 72 years of age, and was widely known as a pioneer of the natural gas industry in the United States. He was born May 13, 1859, and on completion of his schooling went into the paint manufacturing business with his father. Later they invented the first gasometer.

In 1887 Mr. Bullock entered the natural gas industry, and was connected with it from that time until his death. One of his pioneer enterprises was the building up of the Kansas Natural Gas Co., and later he joined the firm of Henry L. Doherty & Co., and was headquartered at Bartlesville in an executive capacity.

In 1924 Mr. Bullock organized the Wichison Industrial Gas Co. and the Larutan Gas Corp., remaining in the post of president in direct charge of operations of the former until his death.

Mr. Bullock was also one of the founders of the Natural Gas Association of America, the organization of which took place at Kansas City nearly 30 years ago.

$30,000,000 Pipe Line for Pacific Northwest is Rumored

Plans for construction of a $30,000,000 natural gas transmission line from Montana and Wyoming centers to the Pacific Northwest are rumored, following the filing of an application for permission to construct a line along certain of the Oregon and Washington State Highways by D. E. Lamb. Mr. Lamb in his application before the Highways Commission in Washington gives his company affiliation as the International Utilities Corp. and headquarters are listed as Seattle. Mr. Lamb is president of the company. Inquiries to the International Utilities Corp. of New York bring forth denial of that company's connection with the project.

A hearing which was scheduled to be held before the Washington State Highway Commission on November 24 was postponed until a later date, according to word received from the State director of highways.

The Oregon State Highway Commission, through its attorney, verifies the fact that an application is pending before that body for permission to construct a 20-inch line along certain of the Oregon state highways.

Much speculation is rife concerning source of supply and possible route of the proposed line. Preliminary plans as stated in the application, are said to call for a 20-inch trunk line from Montana centers, joining a line from fields in Wyoming, and extending through Pocatello, Ida., to points on the coast.

Kansas Pipe Line & Gas Co. Acquires New Properties

Properties of the Public Service Co. of Kansas and Peoples Gas Co., headquartered at Tulsa, Okla., and both headed by J. W. Shenefield as president and general manager, have recently been acquired by the Kansas Pipe Line & Gas Co., Salina, Kan. Public Service Co. of Kansas serves Pratt, Protection, and Coldwater, Kan., and Peoples Gas Co. serves gas in St. John, Stafford, and Greensburg, a line being constructed to St. John and Stafford within the last year.

McFayden and Denning Apply for New Idaho Permit

Jno. B. McFayden and L. B. Denning have applied for a certificate of convenience and necessity to construct a pipe line from Wyoming fields to Pocatello, Ida. An application granted earlier in the year gave permission to extend the Wasatch Gas Co.'s line from Ogden, Utah, to Pocatello, Ida., this permit also being in the names of Mr. McFayden and Mr. Denning.

R. H. Lussky to Manage Okla. Properties for Gas Company

Announcement has been made of the appointment of R. H. Lussky of Guthrie, formerly of the Oklahoma Corporation Commission staff, as manager of the Oklahoma properties for the Oklahoma Public Service Corp., of which John H. Reed of Cedar Rapids, Iowa, is president, and J. J. Hall of Denver, vice-president. The company is engaged in producing oil and gas in Kansas and Oklahoma with 11 producing gas wells in the Oklahoma City and Earlsboro fields. It sells gas wholesale to the State Fuel Supply Co., has the gas distribution system in Ochelata and sells direct to the Dewey-Portland Cement Co. at its Dewey plant.

1932 "Better Copy" Contest Soon to Get Under Way

Rules and conditions for the 1932 "Better Copy" Contest of the Public Utilities Advertising Association have been announced. The contest is to be conducted in three main divisions: gas for home and industry, electric light and power, and transportation. Gas company advertising will be judged under two classifications: institutional and merchandise. Judging will be in the hands of the American Gas Association, the National Electric Light Association, the American Electric Railway Association and the Advertising Federation of America. Eric W. Swift is chairman of the Better Copy Committee of the Public Utilities Advertising Association.

"Oxy Acetylene Welding and Cutting" in Second Edition

The second edition of Stuart Plumley's book on Oxy Acetylene Welding and Cutting was recently brought from the press. The book contains more than 400 pages and is presented in two parts, the first part being in the form of lessons dealing with the various phases of welding and cutting. There are 20 lessons in all. Part 2 is divided into seven chapters. The book contains many illustrations and diagrams.

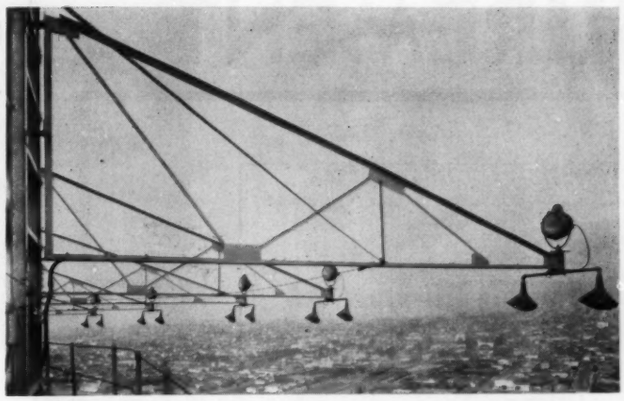
Mr. Plumley is chief engineer of the Smith Welding Equipment Corp., Minneapolis, Minn.

Pipe Line For Transporting Carbon Dioxide Gas

A pipe line for the purpose of transporting carbon dioxide gas is under contemplation in Colorado, according to recent reports. It is stated that construction of a pipe line from the Walden field in Colorado, where carbon dioxide gas is being produced, to Laramie, Wyo., will get under way in 1932, and that manufacturing of dry ice at the terminus of the line will begin as soon as the pipe line is completed. Continental Oil Co. is carrying on drilling operations in the territory.

United Gas Public Service Co. Extending Service Area

United Gas Public Service Co., Houston, Texas, plans construction of gas transmission mains totaling about 25 miles. A 14-mile line will be laid from Longview to Gladewater, supplying points en route. The company will extend service areas in Longview, Gladewater, Kilgore and Henderson, all in Texas. According to reports, service will also be extended to Turner Town, Teneryville and others. The lines will all be of small diameter pipe.



AT LEFT

Ten structural steel arms each 22 feet long support the lighting units which illuminate the sign on the 50th Avenue gas holder of the Pacific Gas and Electric Co., Oakland Calif.

Lighting P. G. and E. Co.'s Waterless Gas Holder

HANDICAPPED by the physical limitations of the ground space and the absence of any adjacent buildings from which usual methods of flood lighting could be operated, engineers of the Pacific Gas and Electric Co. of San Francisco have nevertheless succeeded in installing a lighting system for the new sign on the company's waterless gas holder at 50th Avenue in South Oakland.

"P. G. and E.—Natural Gas—The Modern Fuel."—In a sign 82 feet high and 160 feet long, this message is easily readable a mile away.

The company, following its policy of utilizing the surface of its gas holders to advertise natural gas, recently had the new sign painted on this giant gas holder, which is about 325 feet high by 200 feet in diameter, with a capacity of 10 million cubic feet of gas. Because of its great size, and its isolation from other large structures, the holder stands out very prominently.

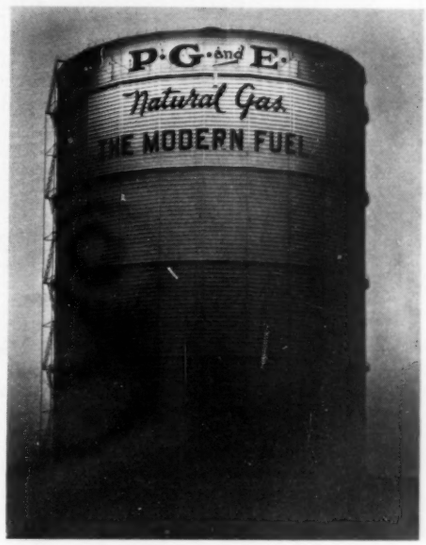
The problem of a satisfactory and efficient lighting system was solved by constructing 10 structural steel arms, each 22 feet long and each one hinged to the side of the holder on structural steel channels. These arms are guyed with flexible steel cable so that they will swing around to the face of the holder. From the upper level platform, lamp trimming and cleaning can be readily and safely accomplished.

The top section of the holder, approximately 22 feet high, is lighted by 10 enclosed type, copper cased reflectors, with medium stippled lenses, each containing a 1,000 watt 120-volt PS-52 lamp. The lower section, approximately 60 feet high, is lighted by a total of 20 elliptical angle reflectors, each containing a 1,500-watt 120-volt PS-52 lamp. The result is 15 foot candles average intensity.

The 2300 volt single phase service for this total of 40 kw. of sign lighting originates at an electrical center located in the gas compressor station approximately 200 feet from the holder. The service is transformed at the base of the holder to 125/250 volts, 3 wire, and the voltage at the lamp socket averages about 122 volts.

All wiring is installed in galvanized rigid conduit and water-tight junction boxes. Joints on the holder structure were made with connectors, so that no welding or soldering torches were used on wiring which is mounted directly on the holder. The service is controlled by a time clock equipped with an astronomical dial.

The lighting system as shown in the accompanying illustration, was designed by Wm. P. Bear, lighting engineer, Pacific Gas and Electric Co.



13,120 square feet of lighted area on the 50th Avenue holder makes the slogan "P. G. and E.—Natural Gas—the Modern Fuel" visible a mile away.

Texts on Water Heater Salesmanship by Cleveland Heater Co.

The Cleveland Heater Co., Cleveland, Ohio, has recently published a series of texts on practical salesmanship. Twelve booklets are divided into three major classifications of Sales Methods, The Market, and The Product, with four booklets covering each subject. The separate texts deal with the following topics: Your Opportunity, The Six Steps in a Sale, Presenting Your Product, Principles of Business, People, The Need for Automatic Hot Water Service, Finding Prospects, Why People Buy, Water Heaters, Automatic Water Heaters, The Gas Industry, and Useful Information and Tables.

St. James Franchise Granted

St. James, Minn., recently voted in favor of granting a natural gas franchise to the Peoples Natural Gas Co. of Omaha, Neb.

MEASUREMENT and CONTROL

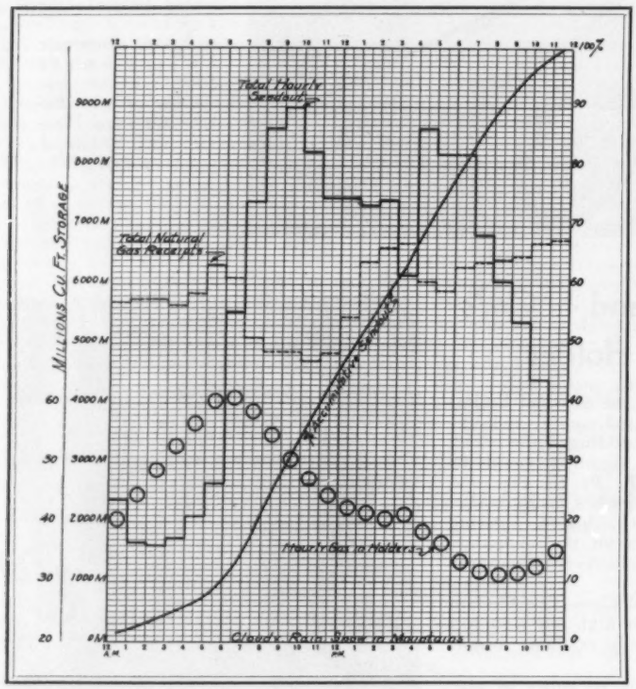


Fig. 1. Los Angeles Gas and Electric Corp. hourly send-out, Jan. 11, 1930, send out 136,205 M.c.f. The graph shows the fluctuating load on a day of heavy demand. Decrease in natural gas receipts from 6:00 A.M. to noon is due to the heavy demands of outlying territories adjacent to trunk transmission lines. Note how holder operation meets the very high demands during the daytime. Independent active domestic meters on the L. A. G. and E. system during January, 1930, were 356,502.

Problems of a Meter Engineer

By ROY M. BAUER

*Southern California Gas Company**

PRODUCTION, transmission, and distribution are the three main branches of the gas industry and in each of these the meter engineer has his problems.

Let us follow briefly the course of the natural gas from the well to the consumer and pause at different points to set forth the metering problems.

Roy M. Bauer

Natural gas in California is produced from gas and oil wells in 26 fields (see Table No. 1) scattered over a wide area. The six associated Pacific Lighting Corp. companies in southern California receive their supplies from 24 of the 26 fields.

The dry gas, produced from horizons barren of oil and the casinghead gas produced in conjunction with oil from oil wells, vary in B.t.u. and specific gravity from field to field. The B.t.u. per cubic foot ranges from 900 to 1,225 (see Table No. 2) and the specific gravity from 0.575 to 0.75. In a field where the casinghead gas is produced from one zone, the B.t.u. and specific gravity are fairly constant as a rule, but where there are different producing zones or dry gas and casinghead gas (i.e. Buena Vista Hills) fluctuation occurs.

We may have any one, or all, of these three disturbing problems in the production and in the delivery to major transmission lines:

1. Fluctuating specific gravity.
2. Occasional absorption oil troubles.
3. Pulsation due to compressor plant operation.

In addition to these problems coming from high pressure compressor plants, the gas may drop water when the temperature or the velocity is reduced. If this water collects in low places where no drips are located, it may be carried over in a slug when a very heavy demand is placed on the line. This may cause temporary metering troubles.

The incoming gas is controlled at a number of terminal stations where regulators and check meters are located. Proper engineering methods have solved most of the measurement problems in the stations. We have, however, the ever-present fluctuation in demand. Newhall station of the Southern California Gas Co. may measure volumes of from 1,000 M.c.f. and hour to as high as 4,500 M.c.f. an hour, all within a 24-hour period.

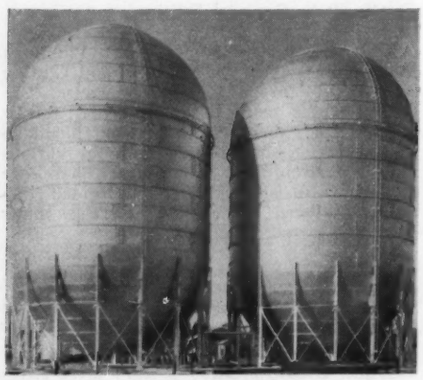
The gas from various terminal stations is delivered direct to consumers, and, during periods of small usage, to holder stations. Here again we have the problem of fluctuating specific gravity due to mixture variations.

So much for the general problems. Let us turn our attention to fluctuating deliveries, and ascertain their cause and what steps are taken to reduce the fluctuations.

Adequately providing for peak demands is the problem of every natural gas company. A well designed distribution system will be just large enough to handle the peak demand and will then be supplemented by sufficient holder capacity to insure a supply to take care of load fluctuations. The peak hour demand occurs between 7:00 A.M. and 9:00 A.M. and, in the Los Angeles Metropolitan area, equals 7 per cent to 8 per cent of the total gas sendout during the day. Peak days occur during the period, December to March inclusive. On such a day the consumption will reach tremendous proportions and will equal 4.5 per cent to 5 per cent of the total consumption for the month.

The variations spoken of are largely in the domestic load. Industrial and steam generating plant usage also varies between day and night and from one season to another.

Peak hour demand is usually provided for by taking advantage of line pack and by storage in gas holders. Packing the line reduces the delivery through the terminal. When the pack is withdrawn in the morning,

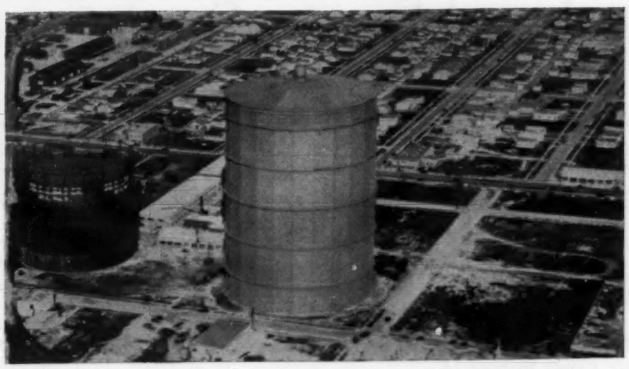


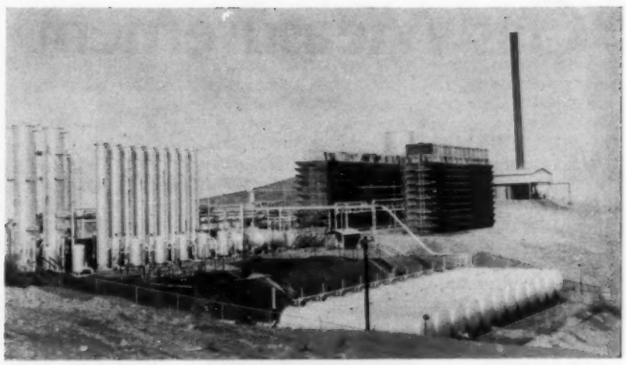
Two of Southern Counties Gas Co.'s high pressure gas holders, located at Pomona, Calif.

Table I—Gas Producing Fields in California

L. A. Basin	*Coastal Area*
Athens-Rosecrans	Elwood
Brea-Olinda	Goleta
West Coyote Hills	Rincon
Dominguez	Santa Maria
Huntington Beach	South Mountain
Inglewood	Ventura Ave.
Long Beach	
Montebello	*West San Joaquin Valley*
Playa del Rey	
Potrero	Buena Vista Hills
Richfield	No. Belridge
Santa Fe Springs	Buttonwillow
Seal Beach	Dudley Ridge
Torrance	Elk Hills
	Kettleman Hills

*Presented before the Southern California Meter Association, October 22, 1931.





IN THE VIEWS above are shown, on the left the holder and compressor station of Southern California Gas Co., Los Angeles, with water-sealed type holder at the left and the company's 10,000,000 cubic foot waterless type holder at the right.

IN THE VIEW on the right is the Los Nietos Refining Co.'s high pressure absorption plant at Kettleman Hills. Gas from this plant enters the transmission line of the gas company at 425 pounds pressure.

the terminal deliveries rise above the average. This is one cause of variation in volume through terminal stations. Storage in gas holders at night and withdrawal during the daylight hours helps equate the pipe line flow rate. Gas storage equipment is of three general types, (1) low pressure, water sealed holder. (2) low pressure, waterless holder, and (3) high pressure holder. Low pressure holders have two disadvantages, (1) the stored gas must be recompressed before it enters the distribution system, and (2) only about 10 per cent of the stored gas is available each hour, but the advantage of having large amounts og gas at important distribution centers far overbalances the disadvantages.

Just a word about dispatching. The dispatching bureau is located at the center of operations, and not only controls and regulates the supply to meet the ever-changing demands, but also sees that all purchase and transport contracts are taken care of. Although small in numbers the personnel of this bureau forms a very important cog in the machinery necessary for handling gas from the producer to consumer.

Table 2—Representative Analyses from California Gas and Oil Fields

		Analysis					
Field	*Kind**	% CO_2	% O_2	% CH_2	% C_2H_6	% N_2	*B.t.u. cu. ft.*
Athens-Rosecrans	C.H.	0.2	0.0	84.4	15.5	0.0	1125
North Belridge	C.H.	1.3	0.3	84.4	12.2	1.8	1055
Brea-Olinda	C.H.	0.0	0.2	65.5	32.0	1.4	1205
Buena Vista Hills	C.H.	14.0	0.3	69.4	14.2	2.1	952
Buena Vista Hills	D.	8.0	0.0	84.7	6.5	0.8	967
Buttonwillow	D.	0.4	0.0	98.4	0.0	1.2	984
W. Coyote Hills	C.H.	1.2	0.0	69.7	25.4	2.9	1152
Dominguez	C.H.	0.6	0.0	80.5	18.6	0.3	1121
Dudley Ridge	D.	1.0	0.0	98.5	0.0	0.5	984
Elk Hills	C.H.	4.0	0.2	80.2	5.8	1.7	979
Elk Hills	D.	7.3	0.0	90.9	1.0	0.8	927
Elwood	C.H.	0.0	0.1	75.4	24.5	0.0	1172
Goleta	D.	0.0	0.0	95.1	3.8	1.1	1011
Huntington Beach	C.H.	2.6	0.2	78.6	18.2	0.4	1095
Inglewood	C.H.	7.6	0.3	79.3	10.2	2.6	980
Kettleman Hills	C.H.	0.0	0.0	80.5	19.3	0.2	1155
Long Beach	C.H.	0.7	0.1	72.6	26.5	0.1	1180
Potrero	C.H.	0.6	0.1	74.1	24.4	0.8	1157
Rincon	C.H.	0.3	0.1	75.2	25.2	0.2	1183
Santa Fe Springs	C.H.	0.4	0.1	76.1	23.3	0.2	1158
Seal Beach	C.H.	0.5	0.1	83.7	15.1	0.6	1092
Torrance	C.H.	3.5	0.0	83.8	10.9	1.8	1039
Ventura Ave.	C.H.	0.0	0.0	85.7	13.3	1.0	1099

* C.H.—Casinghead gas after gasoline extraction. D.—Dry gas.

Third Annual Exhibitors Meeting Held

FOLLOWING its annual custom, the Southern California Meter Association on November 19 held its third Exhibitors Meeting, featuring a display of the latest in measurement and control equipment. A score or more individual firms conducted exhibits, showing several hundred pieces of apparatus. The display was conducted in the auditorium of the Los Angeles Gas and Electric Corp. building, Los Angeles, and was open from 3:00 to 10:30 p.m.

A large attendance of gas and oil company representatives was on hand, 158 registering during exhibit hours. At the dinner meeting, held in the cafeteria of the gas company building, 99 were present. The program following the banquet had Col. George Sydney Binckley as its feature speaker, in a general review of fluid measurement development. Col. Binckley's remarks were illustrated by slides, and were followed with much interest.

H. M. Dwight, program committee chairman of the S.C.M.A., also read a brief discussion of "Measurement by the Metric System," prepared by W. P. Porcher, measurement engineer for the Texas Cities Gas Co. at El Paso, Tex., and a member of the S.C.M.A. Mr. Porcher's paper is printed in full in this issue.

The November meeting was one of the most successful of the S.C.M.A. year, and the committee in charge is deserving of much credit for the value of the exhibit feature. Arrangements for the exhibits were in the hands of a committee consisting of M. J. Cereghino, L. P. W. DesBrisay, H. M. Dwight, E. Lorenz, and R. F. Angell. Exhibitors included the following firms:

Aetna Printing Co.
Braun Corp.
Bristol Co.
Brown Instrument Co.
Consolidated Ashcroft Hancock Co.
Foxboro Co.
W. R. Ladewig Co.
Lorraine Corp.
Merco Nordstrom Valve Co.
Midwest Pipe & Supply Co.
Morey & Jones, Ltd.
Neilan Co., Ltd.
Natural Gas Equipment, Inc.
Pacific Meter Works.
Pacific Pipe & Supply Co.
Reliance Regulator Corp.
Republic Flow Meters Co.
Robinson Orifice Fitting Co.
Warren & Bailey Co.
Westcott & Greis, Inc.

A wide range of equipment was covered in the displays, including recording instruments, regulators and controllers, orifice fittings, meter charts, valves and accessories.

52,000,000 c.f. Well at Kettleman

The Kettleman North Dome Association recently placed on production its No. 58-2P well on the north dome at Kettleman Hills, Calif. The well is producing 52,000,000 cubic feet of gas daily.

Gas Measurement in the Metric System

By W. P. PORCHER

Measurement Engineer,
Texas Cities Gas Company,
*El Paso Division**

MEASUREMENT of gas in the metric system is assuming increasing importance among companies operating in Mexico and along the Mexican border. Under this system gas is measured in cubic meters, pressure in kilograms per square centimeter and temperature in degrees centigrade. Orifices are measured in millimeters and recording differential gauges register millimeters water pressure.

W. P. Porcher

For the purpose of comparison it is often necessary to convert from the metric to the English units. While the conversion from either system to the other presents no especial difficulty, it will be found that the method making use of the cubic foot absolute will greatly lessen the labor as well as insure accuracy in the calculation. For the cubic foot absolute due credit must be given H. E. Thompson and his paper on this subject in connection with the Southern California Meter Association course in gas measurement.

Just as the cubic foot absolute is secured by multiplying either standard or flowing cubic feet by the pressure in pounds per square inch absolute and the reciprocal of the absolute temperature in degrees Fahrenheit, the cubic meter absolute may be derived by multiplying either standard or flowing cubic meters by the pressure in kilograms per square centimeter absolute and the reciprocal of the absolute temperature in degrees centigrade. The conversion from cubic feet absolute to cubic meters absolute may be made by means of the multiplier 0.003584 made up of

$$\frac{9}{5} \times \frac{1}{14.2232} \times \frac{1}{35.314}$$

For the conversion from cubic meters absolute to cubic feet absolute the reciprocal, 279.02, is used.

Having reduced the volume in metric units to the cubic meter absolute and then to the cubic foot absolute by means of the above multiplier, in order to get the equivalent volume in English units, at any pressure or temperature, it is only necessary to multiply by the absolute temperature and the reciprocal of the absolute pressure.

Positive Meters

As the base pressure in countries using the metric system is often one kilogram per square centimeter, the base pressure multiplier would be

$$\frac{\text{Atmospheric pressure plus gauge pressure}}{1}$$

all pressures in kilograms per sq. cm. Thus, to secure this multiplier it is only necessary to add the gauge pressure to the atmospheric. This is but one of the many simplifications resulting from the use of the metric system.

The Flow Meter Formula

Assuming the instruments listed below are to be used in the measurement, the flow meter formula for gas may be converted to the metric system as follows:

Recording differential gauge to read in centimeters water column.

Recording static pressure gauge to read in kilograms per square centimeter.

Recording thermometer to read in degrees centigrade.

Orifice and pipe diameters measured in millimeters.

For the sake of uniformity the meter will be assumed to operate at 15.55°C. (60°F.)

Basic formula:

$$Q = 3600\ A\ V\ C_v \quad \text{(quantity per hour)} \quad (1)$$

$$A = \frac{\pi}{4} d^2 = \frac{.7854\ d^2}{1{,}000{,}000.} \quad \text{(square meters)} \quad (a)$$

$$V = \sqrt{2gH} \quad (2)$$

$$g = 32.16 \times .304801 = 9.8024 \text{ meters per sec.}$$

A 1-inch head of water = 1000.22 feet head of air at 1 pound absolute pressure and 60°F., using 62.3668 lb. as the weight per cu. ft. of water at 60°F. and .0051961 as the weight per cu. ft. of air at 1 pound absolute and 60°F.

Therefore:

One cm. head of water equals

$$\frac{1000.22}{2.54} \times .304801 \times \frac{1}{14.2232} = 8.439 \text{ meters}$$

head of air at one kilogram per square cm. absolute and 15.55°C.

$$H = \frac{8.439\ h\ T_f}{288.55\ P_f\ G}$$

H = hydraulic head.
h = cms. water differential.
T_f = degrees centigrade abs.
P_f = kilograms per square cm. abs.

Substituting in (2):

$$V = \sqrt{\frac{2 \times 9.8024 \times 8.439\ h\ T_f}{288.55\ P_f\ G}} \quad (b)$$

Substituting (a) and (b) in (1):

$$Q_f = 3600 \times \frac{.7854\ d^2}{1{,}000{,}000} \times C_v \times \sqrt{2 \times 9.8024 \frac{8.439 h\ T_f}{288.55\ P_f\ G}}$$

Simplifying and reducing to standard conditions:

$$Q_s = 0.002141\ C_v\ d^2 \sqrt{\frac{h\ T_f}{P_f\ G}} \frac{P_f\ T_s}{P_s\ T_f}$$

or

$$Q_s = 0.002141\ C_v\ d^2 \frac{T_s}{P_s \sqrt{T_f\ G}} \sqrt{h\ P_f}$$

$$C = 0.002141\ C_v\ d^2 \frac{T_s}{P_s \sqrt{T_f\ G}} \quad (d)$$

Note: If differential gauge reads in millimeters, multiply the constant in (d) by $\sqrt{\frac{1}{.1}}$ or 0.3162. The value of C_v would the same in either system.

To test the accuracy of this formula, the following equivalents may be made use of:

$P_s = 1$ kilogram per square cm.—equivalent to 14.223 lbs. per sq. in.

$T_s = 15.55°$ C, equivalent to 60° F.

$d = 25.4$ millimeters, equivalent to 1 in.

$G = 1$, equivalent to 1.

Inserting the metric equivalents into formula (d) the metric coefficient is found to be,

$C = 23.47\ C_v$ (cu. meters per Hr.) (3)

Using the English equivalents in connection with the English formula for the coefficient,

$$C = 218.44\ C_v\ d^2 \frac{T_s}{P_s \sqrt{T_f\ G}}$$

C is found to be $350.18\ C_v$ cubic feet per hour. Now since the metric coefficient has been determined at 1 centimeter differential and one kilogram per sq. cm. static pressure, whereas the English has been derived at 1 inch and 1 pound, for the purpose of comparison the English may be brought to the same basis as the metric by multiplying by

$$\sqrt{\frac{1}{2.54}} \times 14.223 \text{ or } 2.366.$$

$C = 350.18\ C_v \times 2.366 = 828.52\ C_v$ cu. ft. that would be passed at 1 cm. differential and 1 kilo per sq. cm. absolute pressure. Reducing to cubic meters, $828.52\ C_v$ divided by $35.314 = 23.47\ C_v$ cu. meters per hr. Compare this with (3) above.

It is of course necessary to have temperature multipliers for degrees centigrade and extension tables in centimeters or millimeters and kilogram units.

* This paper was read in part before the November 19, 1931, meeting of the Southern California Meter Association, by H. M. Dwight, program committee chairman.

Natural Gas Line to American Smelting & Refining Co. Plant Completed

Installation of a natural gas pipe line across the Missouri River bridge at Omaha, Neb., was completed in November by the Northern Gas and Pipe Line Co., Omaha. The line will serve the American Smelting & Refining Co.

S. C. M. A.
Forum of Experience

"Knowledge is built upon the experience of others."

ANY reader of this department is welcome to submit practical questions on measurement and control to the "Question and Answer" committee of the Southern California Meter Association. This committee, of which H. E. Thompson is chairman, each month propounds new questions in the "Measurement and Control" section of *Western Gas*, and answers them the month following. Send new questions, or your answers to questions which appear below, to

S.C.M.A. " Q. and A." Committee,
Box 1100, Sta. C, Los Angeles, Calif.

This Month's Questions

Q. 109. How accurately should the static pressure be determined with reference to the accuracy of determining the differential?—J.C.C. (Ed note: It is often called to our attention that static pressures are not accorded the same respect as differentials.)

Q. 110. We have considerable trouble with stoppage of the ¼-inch orifice connections used in steam service. What do you suggest?—M.F.

Q. 111. How should mercury be cleaned that has in it foreign metals, such as zinc, aluminum or copper?—W.M.E. (Ed. note: Though much has been written on this subject, it is worth repeating.)

Q. 112. Are there other methods of calculating gas flow by orifice-created differential than that indicated by the conventional formula?—G.G.M.

Previous Questions Answered

A. 105. Using a value for "g" of the orifice meter formula that is only approximate will produce in the final cubic-feet-per-hour finding an error that is half as great (both measured on a per cent basis). Thus, using "g" as 32 instead of its true value of 32.1429, puts an error of −.44 per cent under the radical and results in an error of −.22 per cent in the finding.—W.C.P.

A. 106. A bent pen arm of an orifice meter recorder will not, of itself, cause any error whatever. But if the bending was necessitated by loss of mercury or by the accumulation of water or oils on top of the mercury, merely bending the arm to cause the pen to zero correctly will remove the error at zero, but introduce another error that will appear farther out on the chart. If the pen arm is that of the pressure pen, exactly the same may be said. In either case, the necessity of bending should be interpreted as warning that a maladjustment exists elsewhere, which cannot be entirely remedied by this makeshift.—J.W.

A. 107. In measuring gas by orifice meter we must use coefficients that are handed down to us by the scientific investigators who determined them from set-ups of a particular nature. Only by adhering closely to the standards of these original set-ups can we be assured that the coefficients will give true flows. We are particularly warned against tapping the line in such a manner as to produce burrs that will divert the high velocity gas that passes the taps either into or away from them, thereby causing the differential as recorded to be other than the true difference in pressures. The 2½ and 8 pipe diameters are given us as minimums, not as specific dimensions. The error due to small variations is slight, but cannot be arbitrarily stated.—R.H.M. (Ed. note: It is safe practice to follow instructions closely when not certain of the consequence of deviation.)

A. 108. If allowed freedom of selection in the matter of valves for the pressure connections of an orifice meter, choose valves that will never leak, either at the seat or at the stuffing box; for a small leak makes meter checking or calibration very difficult. The pressure and the nature of the fluid being metered will enter into the consideration. Those adjacent to the meter should be needle valves; those adjacent to the meter run should be valves of wide free opening such as gate valves or "Corporation cocks." Choose valves recommended by the makers for pressures not less than five times the existing static pressure, and little inconvenience should result.—H.E.T.

Paint as a Protective Coating for Meter Installations

By G. HARRY MILLER
*Mathews Paint Company**

GAS meters for many years have been coated with asphaltum or gilsonite paints. They have been coated also with black baking enamel, which is generally applied by dipping or spraying. These finishes have served their purpose very well.

In recent years aluminum paints have been used on gas meters, gas pipes, gas valves, and gas holders. For exterior exposure aluminum paint has given better results than the black paints. However, the black baking enamels have stood up very well under the most trying conditions. Because aluminum paints and asphaltum paints serve as very good protective coatings, they are often selected as one-coat finishes. One of the desirable features of aluminum paint is that it hides and covers more surface than almost any other paint.

In repainting aluminum surfaces it is best to use aluminum paint. When recoating asphaltum surfaces, in all cases, best results are obtained by using asphaltum paints. Baking enamel, however, can be recoated when the surface is in good condition with either paint, varnish or lacquer.

A gray metal coater is also extensively used to paint gas meters. It has a number of outstanding features in that it serves as both primer and surfacer, as well as finish coat. This gray metal coater makes an exceptional surface for refinishing. It can be cleaned, sanded and then recoated with either paint, enamel or lacquer.

Because of its many advantages lacquer is becoming more and more recognized as one of the leading finishes. It is very resistant to alkali, dilute acids, sulphur fumes, steam, oil and grease, and for this reason is considerably used on instruments, instrument boards, motors, compressors, gates and valves in and about gas plants.

Lacquer is easily applied and dried quickly to a hard, dull or glossy film. With the new industrial brushing lacquers now obtainable in black, white, and colors, such maintenance as meters particularly, can be refinished in a few minutes' time. And brushing lacquers can also be sprayed as well as brushed by reducing to spray consistency with a suitable spray thinner.

Preparation of Surfaces

In finishing new work, if it be steel or iron, clean the surface thoroughly by removing all grease, oil, wax and dirt, either by steam cleaning or washing down with solvent naphtha. Gasoline can be used where there are no open flames or other danger of ignition. Wherever sheet metal is to be coated, neutralize and etch the surface with a copper sulphate solution (one pound copper sulphate in one gallon water). Apply the solution to the surface of the metal with a brush; after four or five minutes wipe dry. Sand off any loose scale and wash down with gasoline. This surface is now in good condition to receive its finish, whether it be a metal primer, a metal primer-surfacer, or a single coat finish.

A paint, varnish, enamel, or lacquer cannot be expected to adhere to a dirty surface. About 60 per cent of our paint failures are due to a carelessly prepared surface.

Cast iron surfaces are cleaned much the same way, excepting that they are cleaned with a steel brush instead of being sandpapered. The average cast iron surfaces are porous and rough. They are generally primed with a suitable primer, over which a coat of surfacer is applied; then glazed out with a good glazing or knifing putty; sanded, and a second coat of surfacer applied, which is also sanded out smoothly before applying the final coats. Each coat must be thoroughly dry before applying the succeeding coat. The finishing coats can be either paint, enamel, varnish or lacquer.

A first-class, durable and lasting finish is only obtained by the selection of first-class material for the purpose, applied by a skilled workman to a properly prepared surface. A very large portion of the surfaces successfully finished today have been applied by men who are not professional painters, but who have had some experience with a brush or spray gun and have carefully planned their procedure.

Recoating

In maintenance, where old finishes are to be recoated, the same care in cleaning must be observed. If it is a painted surface, dust it off, be sure that it is clean and dry, remove all loose particles, and sand all rough edges before applying the paint. If the surface is metal, all exposed rusted spots must be sanded well and primed with a metal primer. Where the final finish must be smooth and level, all uneven spots should be glazed over a well dried primer; then a surfacer applied,

*Presented before the Southern California Meter Association, September 24, 1931.

which should be left to dry, and finally sanded smooth before applying the finishing coats. The final coats, when thoroughly dry, can then be rubbed with pumice and water for a dull finish, or polished with rottenstone and oil. There are also a number of rubbing compounds and polishes on the market that can be used with very satisfactory results.

No matter whether your finish is a coat of paint, a coat of varnish, or a coat of lacquer, your surface must be clean. As yet there are no finishes that will attach themselves to an oily or greasy surface.

Where a surface has been waxed, it is best to remove the old finish. Paint, enamel, oil primer or surfacer, and lacquer will not adhere to a waxy surface. Wax also paralyzes the drying of any finish and is one of the most troublesome surfaces to repaint, no matter how well it is cleaned. As a rule, benzole or turpentine are used to remove the wax from the surface. Most surfaces, however, are waxed with either a wax paste or a liquid wax. In either case the wax solvent carries the wax into the paint, varnish or lacquer film, depending more or less upon the solvent used.

One coat of lacquer is often used in dull black to coat instruments, electric and steam gauges, meters, etc. More often an oil primer is applied first; it is more flexible and has more adhesion to the metal. Lacquer will attach itself to paint and long oil enamels that have been well dried, and if in good condition these make excellent undercoaters for lacquer.

Paint and varnish, however, will not attach to lacquer for any reasonable length of time, due to the lack of lacquer solvents.

To coat over an old lacquered finish in good condition, clean the surface in the usual manner by removing all grease, wax, dirt and loose particles first. Then spray a coat of thinner all over the old finish to swell the old coat of lacquer; let dry about 15 minutes and sand lightly; proceed with a coat of lacquer surfacer if necessary; then follow with the lacquer enamel as selected to obtain the desired finish.

Gilsonite, asphaltum and coal tar pitch are still being used for underground coatings. Some are air drying, others are baked, while still others are semi-drying and non-drying coatings of a plastic nature, and are applied both hot and cold to gas mains, conduit and cement foundations.

Aluminum paints, composed of an asphaltum vehicle with one to two pounds of aluminum added, have also been used for underground coatings.

Gas tanks, holders and scrubbers are usually primed with red lead, blue lead, or sublimated lead in linseed oil, then finished with a good grade of outside paint of a selected color.

More recently aluminum paints have come to the fore, due to their exceptional protection. These paints are made with specially designed liquids, that float the aluminum to the surface of the film. The aluminum itself must be a specially selected grade that is compatible with the vehicle to the extent that when the film is dried the entire coat is one continuous unbroken film of aluminum. Generally from one to two pounds of dry aluminum are added to each gallon of vehicle.

Both the paint manufacturer and the aluminum maker can furnish varnish polished aluminum, which comes in paste form; it is more conveniently handled without dusting. Generally 1½ to 2¼ pounds of this paste are added to each gallon of vehicle.

To finish articles made of sheet aluminum and obtain the best adhesion, wash the surface with a copper acetate solution, applied with a brush; let dry about 5 or 10 minutes, wipe off clean, then gas sand with No. 320 wet or dry sandpaper using a good grade of gasoline. (The copper acetate solution is made by adding 1 lb. copper acetate to one gallon of water.) Cast aluminum surfaces are treated in the same manner, except that they are brushed with a steel brush instead of being sandpapered, and are finally washed off with gasoline.

New tin roofs and galvanized steel buildings are treated with a zinc sulphate solution (one pound zinc sulphate to one gallon water), much the same way as aluminum, except that the solution is left to dry and the surface dusted off before applying the protective coatings.

In conclusion, no matter whatever the surface, it *must be clean.* Old coated surfaces should be carefully examined, for checking, adhesion and soundness of film. If in doubt, remove the old coats and begin over again, for if your undercoats fail, you have lost both material and labor in the application of your refinishing coats.

Special coatings are designed to take care of specific problems, but they must be properly applied to give satisfactory service.

Meter Course in Session at Ames, Dec. 8-11

FOR the eleventh consecutive year, the Mid-West Gas Association in cooperation with the Engineering Extension Service of the Iowa State College is offering its Meter Short Course and Conference to members of the gas industry in the middle west. Sessions will be at Ames, Iowa, December 8-11, 1931.

The course is conducted each year under the direction of a committee from both organizations, which this year is chairmaned by R. L. Klar, engineer of distribution for the Des Moines Gas Co., Des Moines, Iowa, and vice-president of the Mid-West Gas Association. Members of the committee serving with Mr. Klar are Geo. A. Lane, Chicago, Ill.; Lester J. Eck, Minneapolis, Minn.; Arnold C. Rathkey, Waterloo, Iowa; W. A. Pike, Marshalltown, Iowa; D. C. Faber and L. W. Mahone, Ames, Iowa; C. T. Williams, Sioux City, Iowa; A. T. Barrett, Chicago, Ill.; J. M. Drabelle, Cedar Rapids, Iowa; R. F. Galpin, Muscatine, Iowa; A. L. Fritchey, Pittsburgh, Pa., and Howard Peirce, Davenport, Iowa.

Sessions are divided into two sections, A and B. Section A will be devoted to practical shop practice, and Section B will deal chiefly with the theoretical side of the work, and with papers and addresses on allied subjects.

The course will begin at the morning session on December 8, with an address of welcome by D. C. Faber, director of the Engineering Extension Department, Iowa State College, following which Mr. Klar will give an outline of the course.

Luncheon will be followed by separate sessions of the two sections, Section A spending the afternoon in shop practice, and Section B in hearing two valuable papers, one on "Cost and Design of a Complete Distribution System for Natural Gas" by Walter Coons, Iowa Railway & Light Co., Jefferson, Iowa, and the other by Tom Conner of the Peoples Gas & Electric Co., Mason City, Iowa, on the subject of "Industrial Gas."

On Wednesday, December 9, Sections A and B meet jointly in the Meter Shop Building to hear a paper on "Orifice Meters" by L. W. Spink of the Foxboro Co. Time has been allowed following the reading of this paper to permit exhibitors of orifice meters to present information on their products. At 1 P.M. Section B will hear a paper read by O. K. Smith, United Light & Power Co., Davenport, Iowa, on "Changing Over from Artificial to Natural Gas." Mr. McBride of the United Engineers and Constructors of Philadelphia is scheduled to present a paper on "Size and Purpose of Gas Transmission Lines," with reference to the control of the load factor.

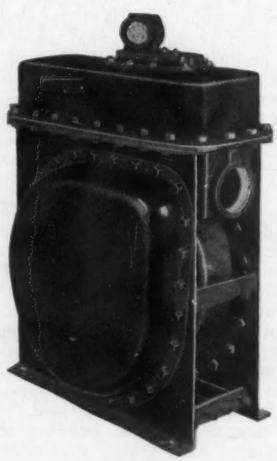
For the morning session on Thursday, December 10, Sections A and B will meet jointly to hear a paper on "Pressure Regulation" by A. D. McLean of the Pittsburgh Equitable Meter Co. After presentation of this paper, time will be provided for exhibitors of other pressure regulating equipment to describe their products.

In the afternoon, two papers are scheduled, one on the subject of "Unaccounted for Gas" by a representative of Western Gas Construction Co., and includes a discussion on fogging, wetting, cleaning and allied subjects. Arlan E. DeBurn, Pacific Pipe & Supply Co., Los Angeles, at this session presents a paper on "Safety in Gas Distribution," bringing in a description and discussion of appliances made for detecting leaks.

The course will close with Sections A and B meeting jointly on December 11 to hear a paper by John E. Naylor of the Peoples Gas, Light & Coke Co., Chicago, on "Testing Meters," and a discussion of "Servicing Customers' Appliances" by L. W. White of the Fort Dodge Gas & Electric Co.

Pittsburgh Equitable Offers New Pressed Steel Gas Meter

The Pittsburgh Equitable Meter Co., Pittsburgh, Pa., recently announced a new addition to its line of "Emco" gas meters, known



as the "Emco" No. 4½ Pressed Steel Gas Meter.

The new meter is patterned after the "Emco" No. 5 pressed steel larger capacity meter, used particularly as an industrial or town border meter. The case is of pressed steel with pressed steel frame welded to-

gether, obtaining rigidity with a minimum of weight.

Another feature of the "Emco" No. 4½ is its compactness. Several of these meters can be placed side by side in the floor space formerly required by one meter of smaller capacity. The manufacturer will send Bulletin 1018 to anyone interested in more complete information on the new meter.

San Antonio Public Service Co. Leak Reduction Program

San Antonio Public Service Co., San Antonio, Texas, in November, 1929, put into effect a system of inspection by meter readers for discovering leaks in the company's mains or in customers' service lines. As a reward for finding leaks, the company offers a bonus rate of 12½ cents for each meter leak and 50 cents for each gas service leak, and $1 for each main leak. Each day the meter reader turns in a report.

As a result of this system, during the first six months of its trial, 1,250 meter leaks were reported, seven service leaks, and three main leaks. During the first six months of the current year the number of meter leaks reported was reduced to 695, service leaks to 18, and main line leaks to 12.

Foxboro Saturation Control Explained in Bulletin 179

A 16-page bulletin on gas saturation control was recently issued by the Foxboro Company of Foxboro, Mass., and discusses problems encountered in the process of saturating natural gas.

This bulletin contains the computations involved in the determination of the relative humidity of any gas. A Universal Relative Humidity Nomograph, for determining the per cent saturation or relative humidity of any gas, designed by Foxboro engineers is contained in the bulletin, styled No. 179.

Complete information on the Foxboro gas saturation controller, together with facsimile records are given in this bulletin. Copies will be sent on request to the Foxboro Co., for bulletin 179.

Change of Meter Readings to Even Hundreds in Effect

Changing meter-readings and customer-billings from even thousands to even hundreds has recently been put into effect by Community Natural Gas Co., Dallas, Texas. The change was made to assist local managers in meeting complaints from consumers on the amounts of the first bill rendered or final bills at the time service is discontinued. Although it has made billing more difficult and reduced the number of bills rendered by operator daily, the company feels the change is beneficial due to decreased complaints and improved customer relations.

New Regulating Station for New Orleans Public Service Inc.

The Gas Department of the New Orleans Public Service Inc. has recently completed a new regulating station in the city distribution system, to be known as the Independence Street Regulating Station. The building is attractively designed in modern Spanish architecture, and the grounds are well landscaped.

There are three regulators stepping the high pressure through intermediate down to low. The metering equipment consists of an orifice meter for measuring large volumes of gas and a displacement meter for small volumes.

Second Southwest Sales Conference

(Continued from Page 29)

and advertising campaigns and by training their sales engineers in the proper utilization of fuel and the capitalizing of all items incident to the use of other and less desirable fuels.

Competitors Progress

The coal and oil interests have not been asleep during the past few years but rather have spent large sums of money in the development of coal stokers; improving the method of handling powdered coal, which has reached high degrees of efficiency in large industrial plants; improving the mechanical atomization of oil, and so forth. Certainly every advantage will be taken of low priced oil, and in some sections of the country low priced coal.

It is hardly reasonable to suppose that the gas rates designed to secure the industrial load in 1929 will prove adequate to hold the gas load in 1932 against the forces of competition; and once this load is lost to gas it will probably have to be regained primarily on the basis of B.t.u. cost. I do not believe that the gas industry can longer afford to ignore the basic economic fact that industrial heat is a commodity subject to the same law of competition in the open market as any other commodity.

Since every natural gas company in the business is charged with the responsibility of making creditable earnings on its investment; and in consideration of the fact that there is probably no natural gas organization which can accomplish this end by its revenue from domestic sales only, it is therefore of vital interest to all of us to develop our industrial load to the extent that our gas supply and pipe line capacity will permit. It is important that we give each industrial problem the proper attention and equip our representatives with industrial contracts sufficiently flexible to enable them at least to interest every industry adjacent to our pipe line system.

There is no doubt but that each industry has one thought in mind when it considers converting to natural gas and the paramount issue is always, "Can we burn gas as economically as the fuel we are now using?" Very few demand a great saving, but all refuse to consider paying a premium for the privilege of burning gas. In view of these obvious facts, is it not then logical that there are two primary questions involved with every industrial sale, the first being—What can the buyer afford to pay? The second—Can we afford to sell at this price?

It must be borne in mind that different natural gas properties, or groups of natural gas properties, present individual problems, due to the size and character of market, distance from source of supply, climatic conditions and cost of competitive fuels. Thus, we find that long established precedents controlling rates and practices in the securing of industrial business, which may in one situation be eminently successful, may prove inapplicable in another.

In the promoting or selling of new industrial load there are several factors which cause hesitancy on the part of all buyers, as:

(1) Fluctuating price of competive fuels.
(2) Possibility of an increase in rates.
(3) Inexperience in the use of natural gas and uncertainly as to how it will affect buyer's operations.
(4) Lack of confidence in the source of supply.
(5) Unfair B.t.u. comparison.

We can readily see where the buyer's first objection is not unfounded, as every large consumer has bought both coal and oil at all kinds of prices during the past two or three years, and in the face of the present oil situation, it is a general belief among all fuel buyers that there is a possibility of a further decrease in price.

To secure this industrial business in our particular situation, we offer all prospective load our established rate for the particular industry we are considering. It has been possible, on this basis, to secure a great percentage of our industrial load since our rates at the time they were established were based on the price of competitive fuels. Recently, due to the extremely low price of distress oil, it has been necessary for us to make a few concessions. We have taken care of these situations by special short time contracts.

The second objection is also reasonable, particularly in new properties, as there is some fear that the rate offered is a promotional rate and that there will be a tendency for the gas companies to endeavor to secure a higher rate as saturation is approached.

The buyer making the third objection is located in a territory that pipe lines have but recently penetrated, and he considers the installation of gas burning equipment as a gamble. He is doubtful as to whether or not his equipment can be converted to natural gas and give satisfactory results, and he feels that he should wait a year or so before converting, in order that he might let others do the experimenting, and then come to a decision after observing his neighbor's results.

Lack of confidence in the source of supply is, of course, an objection that must be overcome before any industry will consider an investment in gas burning equipment, but this objection will eventually fade away as the public becomes better informed. The lack of confidence referred to exists to a great degree through the fault of the natural gas industry itself and could be reduced to a minimum if rival gas companies in their attempt to enter new territories would not infer that the gas companies in competition had a very limited supply and negligible reserves. This inference is commonly made by acquisition and franchise men in their zeal to show by comparison the reserves of the utility they represent.

Unfair B.t.u. comparisons, listed as the fifth objection, have deprived the natural gas companies of this country of millions of dollars, and we believe it advisable to avoid in so far as possible, all B.t.u. comparisons in securing new industrial loads—the reason being that the B.t.u. figures do not consider:

(1) Boiler room payroll.
(2) Actual operating savings.
(3) Interest on the investment in other fuels.
(4) Certain conveniences.
(5) Shrinkage of other fuels.

Time and again a buyer who has delved thoroughly into comparative B.t.u. figures has flatly refused to consider converting to gas, his decision being based on B.t.u. information that we find in most instances unfavorable to natural gas.

Rather than attempt to sell our gas on a B.t.u. comparison, we prefer to combat this objection in a more practical way and make our comparisons direct with the dollars and cents consumption costs of competitive fuels. It was not our policy to donate equipment to any consumer other than charitable institu-

tions, but we proved to our own satisfaction that the best way to combat all of the objections set forth is to insist that the prospective customer let us install the necessary equipment so he can try natural gas under actual operating conditions, without cost or obligation on his part.

In securing this load, it was our policy, prior to the passage of the anti-merchandising law in Kansas, to loan the equipment for a period of from six months to one year with the agreement that they either pay us our installation costs or return the equipment, and in instances where it seemed advisable, we allowed the customer to amortize his equipment over a period of 18 months after the trial period. We did not attempt to make a merchandising profit on our industrial equipment, but added only enough to the cost price to defray deferred interest.

Since the passage of the recent law in Kansas designed to prohibit utilities from selling equipment our policy has, of necessity, been changed. First we try to work through a dealer and assist him to sell the equipment. If this can not be done, and the load justifies it, we will go ahead and install the equipment, capitalize it, and sell gas at the burner tip.

We decided to handle the equipment problem in the manner above set forth, due to the fact that the prospective customer is naturally prone to consider the expense of equipping his plant to use gas as a part of his fuel cost.

By following this procedure we are frequently able to secure new customers on our standard rates, where otherwise a rate concession would have to be made in order to interest them.

As a result of the above procedure we have been able to connect and hold practically all of the industrial load adjacent to our lines. We fully appreciate the fact, however, that different situations present different problems. At a time when the price of competitive fuels is extremely low, it is certainly necessary that a very careful analysis be made, taking into account all factors affecting each particular situation in order to determine whether or not it is good business to attempt to hold or promote each specific industrial load where difficulty is encountered with competitive fuels.

The Circulating Heater Market . . . . .

P. C. TUCKER

Commercial Manager
Arkansas Power & Light Company

THE market for circulating heaters is a mass market. In promoting heaters of this type, we are not shooting at the so-called "four-hundred," but at the four thousand and four million.

The relatively low number of income tax returns in our territories is a good indication of the fact that we have a market largely composed of people who are interested in the most economical rather than in the most luxurious types of heating plants. In these heaters we can offer efficiency which is the equal to that of the high priced plants, and the low first cost of the circulating heater is a tremendous factor in our favor.

Right here, it might be well for us to recognize two divisions of the circulating heater market. The primary division is the small home, apartment, store, office or other building which can be thoroughly heated with a heater of the circulating type. There is also a big market for circulating heaters to be used as an auxiliary to the basement heating plant. In many of the larger homes, there is a certain room or rooms which cannot be adequately served by the basement heating plant. Often we find remodeled dwellings where perhaps a sun porch has been added and one of the small circulating heaters is just the right thing to take care of it.

The circulating heater with automatic control is particularly well suited to stores, lodge rooms, dentist and doctor's offices in office buildings where it is necessary to have a continuous supply of heat and where it is impractical to look after the heating plant between six o'clock in the evening and eight o'clock in the morning.

The freedom from condensation, commonly known as "sweating," is secured by using a flue connected circulating heater and this is a powerful selling point. It seems a great deal to the housewife, but even more to the storekeeper, who wants to keep his window displays visible to the passing public.

A big market for circulating gas heaters has developed in the past few years in connection with school buildings and churches. And the poor business conditions of the past two years have, in many cases, worked strongly to the benefit of the gas circulating heater. I know of a specific instance in a town in Texas, Beeville, where the school board this fall purchased an entire carload of circulating gas heaters to heat the schools in this district because the board's budget did not permit them to install basement heating plants.

I have not mentioned the subject of rates but it deserves some discussion here. While most of our companies in this territory do have low gas rates I think they will bear inspection and, in some cases, revision, to encourage the installation of circulating heaters as this is a splendid method of increasing gas load. There is unquestionably 75 per cent of our possible house heating consumption that can be derived from this source as against approximately 25 per cent of basement heating plants due to our low cost per thousand cubic feet of natural gas and, of course, the high B.t.u. value as compared to other sections of the country. We are, I believe, in an enviable position to secure this kind of business.

Let me suggest that in laying your future plans you give more serious consideration to this large market open to you for circulating heater sales. Just how large this market is in your local territory can best be determined by making a heating survey of each individual home, store and office building. In this way not only can you determine prospects for circulating heater sales but prospects for other appliances you are selling and other uses for gas can be found. When this information has been secured, prospects should be carefully listed on a separate circulating heater file and if vigorously followed, I am sure the sales made will more than compensate for the cost of this survey.

I strongly believe that any company which is selling gas heating should teach its sales people how to survey a house and make an estimate of the probable season's heating cost, even going so far as to make an estimate of the approximate monthly cost during the heating season. It is also extremely effective to arm your sales people with data showing the exact heating cost month by month in the homes of a number of your consumers. If this data can be accompanied by photographs of the house and testimonials, it is still more effective.

Natural Gas for San Diego Still Up for Discussion

Lester S. Ready, employed by the City of San Diego to investigate the possibilities of natural gas service there, brought his report before the city council on November 4. Mr. Ready reported that natural gas would save consumers approximately $650,000 per year.

To make natural gas available, a line would be called for, tying in the San Diego Consolidated Gas and Electric Co.'s system with existing lines drawing from Los Angeles Basin and San Joaquin Valley fields. San Diego Consolidated Gas and Electric Co., now serving manufactured gas in the city, would need to spend about $600,000 in changing over to natural gas. The present plant of the company would be maintained as stand-by service.

W. F. Raber, president of San Diego Consolidated, in a letter to the city council late in November, suggested that the assistance of the California State Railroad Commission be obtained for working out problems arising from the situation. Mr. Raber's letter was in the form of a resolution, and was a reply to a request from the council that the company supply natural gas.

Nashville Tenn., in Line for Natural Gas Service

Nashville, Tenn., will soon have natural gas service through the mains of the Nashville Gas & Heating Co., now serving manufactured gas there. The application of the company for permission has been approved by the Tennessee Railroad Commission. A mixed natural and manufactured gas will be served, and a new schedule of rates will be put into effect on January 1, according to a statement credited to E. A. Price, counsel for the company.

Construction of an 8-inch gas transmission line from the Missouri Kansas Pipe Line Co.'s lines will proceed immediately, gas supply coming from a point in Kentucky.

Johnson Gas Appliance Co. Offers Range Conversion Burner

The Johnson Gas Appliance Co., Cedar Rapids, Iowa, has developed a new range burner for applying gas to kitchen ranges now fueled with coal or oil. The new device is designed for application in converting solid-fuel ranges to gas, and may be installed in any coal range, and may be employed for both cooking and heating. It is equipped with a safety pilot light which prevents the flow of unburned gas. Thermostatic control is optional.

Lone Star Gas Rate Hearing Resumed

The Oklahoma Corporation Commission, Monday, November 16, resumed hearings in connection with its investigation of the rates and practices of the Lone Star Gas Co., Community Natural Gas Co., Meridian Gas Co., and Guthrie Gas Service Co. in Oklahoma. The companies continued introduction of evidence relating to valuation of their properties.

Northwest Oil and Gas Association in Second Annual Session

One hundred and seventy-five delegates representing sections of the Pacific Northwest met in the second annual session of the Northwest Oil and Gas Association on November 6 and 7. The convention was opened by an address of welcome by S. H. Hedges, president of the Washington State Chamber of Commerce, to which E. A. Sims, president of the Northwest Oil and Gas Association, responded. Rolland H. Hartley, Governor of the State of Washington, was also a featured speaker.

Other speakers included R. B. Newbern, president of the Gas Ice Corp.; S. A. McCune, vice-president of the Northern Natural Gas Corp., and Henry Landes, dean of the College of Science, University of Washington.

Twenty-eight trustees were elected at the business session which concluded the convention, and this board will meet on December 11 in Seattle to elect executive officers.

Foxboro Company Announces the "Anti-Ambi" Thermometer

A new device called the "Anti-Ambi" recording thermometer has recently been developed by the Foxboro Co. of Foxboro, Mass. described in Bulletin No. 178.

This new recording thermometer is designed to give true bulb temperatures at all times with freedom from the effects of ambient temperatures (case and tubing temperatures). The thermometer is designed for use on temperature ranges up to and including 250°F.

The new device contains no cams, compensating levers, or bi-metallic strips.

A construction feature is found in the small bulb. The thermometer is so designed that it can make use of a sensitive bulb as small as one inch long.

Wiley F. Corl Appointed V.-Pres. of International Utilities Corp.

International Utilities Corp. of New York City has recently appointed Wiley F. Corl as vice-president. Mr. Corl will be in direct charge of all public utility subsidiaries of the company, and comes from his post as vice-president of the United Gas Improvement Co. to take up his new duties.

Spark Circulating Heaters Form Interesting Display

ABOVE is shown a colorful window display of Spark gas circulating heaters in the Spark Stove Shop, San Francisco, Calif. At the left is a personification of three winter months stalking along, with the slogan "Winter Is Just 'Round the Corner" prominently placed. The oak leaves on the window and background are affixed by a strip of glue along one edge, and a concealed fan caused them to flutter as if in a strong wind.

Christmas Adds Value to Window and Sales Floor

(Continued from Page 20)

Christmas, clever sales argument—maximum of 30 points. (3) Interest Value—Figures or articles in motion, unique arrangement—maximum 30 points.

All districts may use the services of the Advertising Department for the contest, which is being conducted under the supervision of W. D. Thurber, advertising manager. A letter was sent out early in November to all district and sub-district offices, giving an outline of available "scenery" for the contest, as well as general ideas which might be followed out by the contestants.

Public Service Co. of Colorado, under the direction of Charles F. Warmoll, director of window displays for the company, had several interest-compelling displays, among them the single fireplace unit shown in Fig. 4 on the opposite page. A framed poster of a Christmas landscape with a large vase of poinsettias were used as background. Another window featured automatic storage water heaters wrapped in white gift paper, tied with huge red ribbons and decorated with sprigs of holly. In another window gas ranges were shown similarly wrapped and tied to make festive Christmas parcels.

Public Service Co. of Colorado also used a Christmas exterior lighting scheme to advantage in 1930. A gigantic Christmas candle extended nearly the full height of the company's 10-story building. The stem of the candle-stick was outlined in red bulbs, the holder being green. The halo and flame were outlined in flame-tinted lamps, with streamers and wreaths in red and green bulbs. Large stars were outlined with white globes and rectangular lines around the second floor were in red and green.

Portland Gas & Coke Co., Portland, Ore., had several interesting displays during the 1930 holidays. A forest of lighted Christmas trees on the sales floor formed a setting for a very fine exhibit of gas ranges, among them Tappan, Wedgewood and others. (Fig. 2.) At the base of one Christmas tree were grouped several gas appliances, apparently ready to be distributed as gifts, including gas ranges, water heater, washer, ironer, radiant heater and gas-fired refrigerator. Another display by this company had for its central idea a fireplace unit with the slogan "Give Her Something Useful." (Fig. 3.) Other legends employed were "Gas the Aristocrat of Fuels" and "Gas, the Quickest of Fuels." Alcoves on the company's sales floor were used to set up attractive fireplace units, with the Christmas theme introduced by means of wreaths and holly.

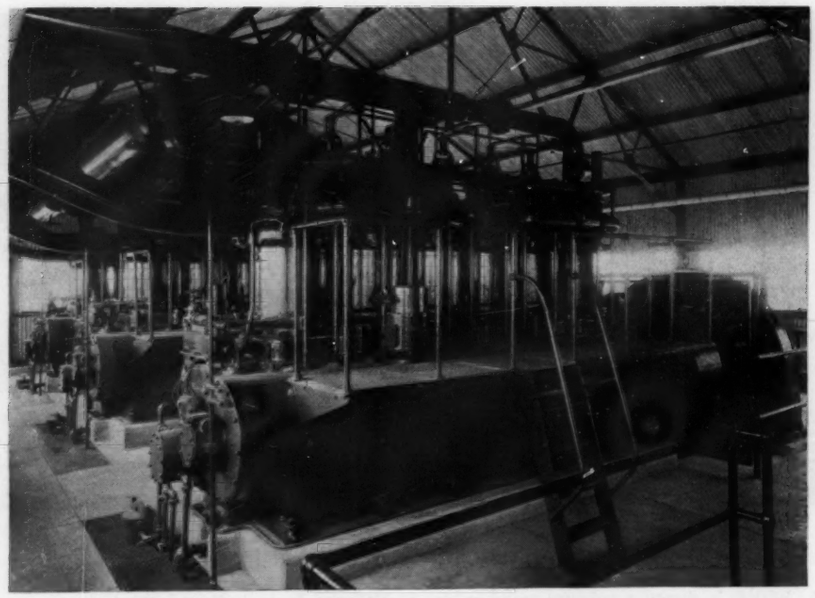
New Rego Catalog No. 57 Ready for Distribution

The Bastian-Blessing Co., Chicago, maker of Rego welding and cutting equipment, announces the completion of a new Catalog No. 57 and offers it to those interested in such equipment.

Rego Catalog No. 57 is a pocket size booklet of 40 pages, indexed for ready reference. It lists specifications and prices of all types of welding and cutting torches, regulators, gas economizer, acetylene generators and the various accessories. This catalog fully describes each piece of equipment and its use.

26-Inch Line Linking Clifton and Mullinville Completed

Construction was due for completion late in November on the 183-mile 26-inch natural gas pipe line from Mullinville, to Clifton, Kan. The line was constructed by the Northern Gas and Pipe Line Co. of Omaha, construction arm of the Northern Natural System. The line is one of the two largest diameter pipe lines in the United States, the other being the recently completed Kettleman Hills-Long Beach line of the Southern Fuel Co. of Los Angeles.



Three Cooper-Bessemer units totaling 1260 B.H.P. and generating 840 kilowatts in auxiliary plant at Fritch, Texas, on Chicago line.

Compressor Facilities on Chicago Line

THE largest electric power plant on the $75,000,000 Texas-to-Chicago gas line is located at Fritch, Texas. Nine similar plants are spaced at intervals of about 95 miles along the line to Illinois, and each serves as an auxiliary to a main compressor plant. All of the 21 generator units are of the latest type, and are designed to operate in parallel, so that the generators in each station can be turned into the same electric system on the grounds.

In addition to other equipment in the first generating plant, there are three Cooper-Bessemer vertical gas engines with an individual rating of 420 B.H.P. Each engine has six cylinders, with the usual 14¾-inch bore and 16-inch stroke. And each engine direct-drives a 280-kw., 2400-volt generator at 300 r.p.m. Alternating current is distributed to the various motor-driven auxiliaries (such as fuel-gas compressors, water pumps, etc.) and to the lighting system inside and outside the different buildings.

In each of the remaining auxiliary plants, included in the necessary equipment are two Cooper-Bessemer vertical gas engines with an individual rating of 260 brake horsepower. Each engine is the four-cylinder, 14¾-inch x 16-inch type, directly connected to a 175-kw., 480-volt, three-phase, 60-cycle alternating current generator.

Motor Fuel From Natural Gas

THE development of a commercially practicable method for converting natural gas into liquid products, particularly motor fuels and solid by-products, is the object of an investigation being conducted by the United States Bureau of Mines, Department of Commerce. A report detailing the results of a study of the decomposition by heat of methane, made at the Petroleum Experiment Station, Bartlesville, Oklahoma, has just been published by the Bureau.

The best average results so far obtained in this investigation from 1,000 cubic feet of methane are approximately 0.3 gallons of light oil, largely benzene, 2.5 pounds of liquid tar containing about 35 per cent of naphthalene and anthracene and 65 per cent of unknown hydrocarbons. In addition there remains about 1,200 cubic feet of gas containing 710 cubic feet of methane, 440 cubic feet of hydrogen, and 25 cubic feet each of ethylene and acetylene. This residue gas has a calorific value of 775 gross B.t.u. per cubic foot at 60°F. and 30 inches of mercury.

The presence of small amounts of ethane (5 to 15 per cent) as generally found in natural gas, increases the yield of liquid products markedly. Inert diluents, such as nitrogen, have no adverse effect unless present in large amounts. Hydrogen tends to depress the yield, whereas acetylene and ethylene cause an increase.

The data obtained in this investigation point to certain general conclusions which give further evidence of the commercial application of the method of pyrogenic synthesis of gaseous, liquid, and solid hydrocarbons from methane. No attempt has been made to compare the results with those of other investigators because the data are not on a comparative experimental basis, and because there are some contradictory results concerning which the experimentors at the Petroleum Experiment Station wish more confirmation. Nevertheless, the following items are given as the present findings of major importance from the work done with relatively small scale apparatus, which are described in the report:

The pyrolysis of methane yields (exclusive of carbon and hydrogen) higher hydrocarbons, among which the following have been identified: Ethylene, acetylene, benzene, naphthalene, anthracene and pyrene. Besides ethylene and acetylene, other gases are produced in small amounts, among which methyl acetylene is suspected. There are also formed unsaturated liquids boiling below and above benzene, and liquids and solids of very high boiling point, presumably high in carbon content.

The yields of these products obtained from methane at atmospheric pressure depend on the temperature and rate of flow through the cracking zone, assuming other factors equal. However, an increase in duration of heating is not equivalent in all respects to an increase in temperature.

Ethylene appears to be the dominant factor at the beginning of the pyrolysis, the other hydrocarbons being formed subsequently; but it is impossible to determine yet whether the light oil proceeds from ethylene or acetylene.

Dilution of the gas with either nitrogen or hydrogen affects the yields, probably due primarily to heat transfer and polymerization. In addition, hydrogen decreases the yields due to suppression of the dissociation of methane. With both diluent gases the per cents of ethylene and acetylene in the total products are increased.

Ethane admixed with methane increases the yields of all products considerably.

Further work is in progress on a larger scale laboratory basis to show more fully the effect of such factors as diameter, length, and material of heating tubes; preheating of incoming gas; and subsequent treatment of the exit gas as it emerges from the cracking zone of the equipment.

Additional information in regard to the results thus far obtained in this investigation is published in Bureau of Mines Report of Investigations 3143, "The Production of Motor Fuels from Natural Gas—I, Preliminary Report on the Pyrolysis of Methane," by H. M. Smith, Peter Grandone, and H. T. Rall, which can be obtained without cost upon application to the Bureau.

Western Service Co. of Okla. Leases Shawnee System

The Western Service Co. of Oklahoma has leased the distribution system owned by Oklahoma Natural Gas Corp. at Shawnee, Okla., for 25 years. Western Service Co. of Oklahoma is a new corporation formed through the merger of four Oklahoma companies, one of which was the Western Service Corp., headquartered at Oklahoma City. At the time the merger was announced, Western Service Corp. had under construction a distribution system at Shawnee, having secured a gas franchise there on August 6. Construction on the new system was stopped and negotiations carried through with Oklahoma Natural by the newly formed company.

Applications Pending in Nine Idaho Cities for "Natural" Service

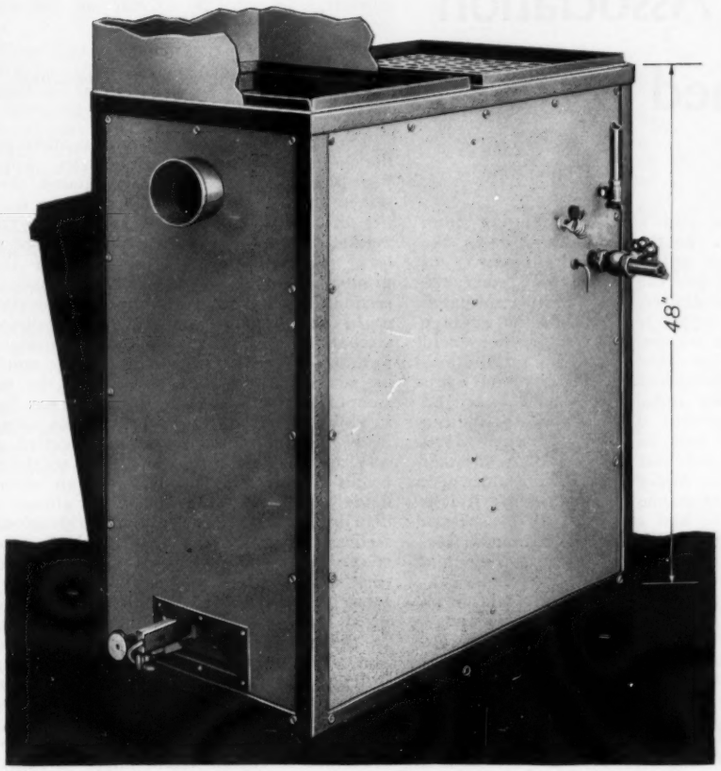
Natural gas prospects for western Idaho are looking up, with five companies reported as having applied for franchises in the district. According to report from the district, H. H. Underhill has filed the most recent request, asking permission of the Public Utilities Commission to serve Weiser, Payette, Fruitland, New Plymouth, Emmett, Parma, Caldwell, Nampa, Boise, and other territory.

To Vote December 15 on Gas Franchise at Worthing, S. D.

The city of Worthing, S. D., will vote on December 15 on granting a gas franchise to the Sioux Falls Gas Co., Sioux Falls, S. D. Supply would come from a line now being constructed by the Missouri Valley Pipe Line Co., Omaha, Neb., from Sioux City, Iowa, to Sioux Falls, S. D.

The same company is applying for a franchise in Lennox, S. D.

NEW



A COMPACT GAS-FIRED FURNACE

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Surface Combustion is pleased to announce a new small, compact, gas-fired unit that provides filtered and humidified warm air with forced circulation, This new unit is sensational in its compactness. It meets a long-felt need in the Gas Industry for a mechanically designed, self-contained appliance that is flexible in its application and is especially adapted to use in small homes or to multiple installations in larger homes. It is available in either single or double units.

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IN PRINCIPAL CITIES

Western Distributors—Natural Gas Equipment, Inc.—Los Angeles—San Francisco

BUTANE - PROPANE NEWS

Covering Liquefied Petroleum Gas Service

National Bottled Gas Association Field of Service Defined

By MARK ANTON

President
National Bottled Gas Association

ORGANIZATION of the National Bottled Gas Association a few weeks ago is being generally hailed as a forward step for this industry. Need for organization for the sake of sound future growth is well recognized, and the N. B. G. A. comes into being with a very definite mission. For the benefit of "Butane-Propane News" readers, Mark Anton has prepared this statement, which clearly defines the Association's field of service. Mr. Anton, of the Suburban Gas Co., Belleville, N. J., has been elected to serve the Association as president, as covered in these columns last month.

Mark Anton

The Association enters upon its work of improving bottled gas merchandising practices with every assurance of cooperation from all responsible elements of the industry.—EDITOR.

IT can always be assumed that for every result there is a cause. The National Bottled Gas Association was not organized just to make another addition to the already crowded trade association domain. It was created for the very definite reason that trade conditions were demanding a means for practicing the Eleventh Commandment—"Know Thy Competitor." The efforts of every industry can be divided roughly into two classifications—production and merchandising, and it is with the merchandising division of the bottled gas industry that the N.B.G.A. will concern itself. All articles which the writer has read have discussed primarily the technical and production phases of this new industry. The selling phase has been touched on only lightly if at all.

A brief resume of how bottled gas has been sold to the consumer might be apropos at this time. When bottled gas—which is the generally accepted trade name for liquefied propane, butane, etc.—was first offered to the consumer for home use, it was required that he purchase outright a metal cabinet with all necessary reducing and shut-off valves and gauges. This equipment when installed was sold at prices ranging from $100 to $300. In the majority of cases, the consumer was still under the necessity of purchasing a gas range and such other appliances as he desired and was also obligated for his first supply of gas. To the average customer, this represented a major household investment, yet thousands of installations were made throughout the country under this plan and they formed the nucleus around which the present bottled gas distributing systems have been built. In the early days, except in population centers, the consumer had to service himself, i.e., the replacement cylinders were shipped to the nearest freight station and he had to attend to the cartage and connect the cylinders into his house system. This pioneer method of selling had two grand redeeming features, inasmuch as it permitted a very handsome gross profit on the sale of the cabinet and the gas range. Sales were generally effected through authorized dealers and agents, who in many cases established sub-agents in the smaller towns. The first company to inaugurate a national advertising campaign using periodicals and direct mail matter, was the Carbide and Carbon Chemical Corp. with "Pyrofax," and the work resulted in appraising millions of householders in non-gas serviced areas of the availability of bottled gas.

It was early apparent that because of the relatively high investment required, bottled gas was restricted in its market to those possessing more than moderate incomes and that in order to have bottled gas universally adopted, all original sales plans would have to be revamped.

Very naturally the utility company methods furnished the answer. A plan was evolved called the "Leased, or Connection Charge Plan"—the salient features of which were that the ownership of the cabinet, reducing and shut off valves, gauge and cylinders remain with the company distributing the gas. Only a nominal connection charge of from $30 to $45 is made, but the right to the sale of the gas range and gas appliances is generally reserved by the distributor to himself. This reservation is twofold in purpose—it permits of a profit on the entire transaction that helps amortize the cost of solicitation and it restricts the use of any but approved ranges and appliances. A user of bottled gas under this plan becomes a subscriber in the generally accepted meaning of the word. Bottled gas distributors do not operate under the favor of non-competitive franchises, but by providing gas service at a low installation cost in return for a signed subscription, covering a period of several years for the service, a protected load can be built.

The tail has wagged the dog in other than the automobile and radio industries. Liquefied gas producers very early found themselves able to produce a much larger quantity of gas than could be absorbed by the market that had been created. Most of the large producers were also retailing their product, but for economic reasons, only in sections where concentration of subscribers could be effected. Independent distributors were therefore encouraged by the producers to enter the field so as to provide as quickly as possible, additional outlets for the consumption of this surplus gas. As has been so ably pointed out in many previous articles in *Western Gas,* the market for bottled gas service has been little more than scratched; yet in the scramble for business, an unjustifiable effort has been made by almost all distributors or their field men to "steal" subscribers from each other. Distributors seemed only too willing to match or better each other's ideas of credit extension. No sales plan for bottled gas that has been devised to date leaves anything to be desired. In the general competition for the oil stove and electric range dollar, the bottled gas distributors have each developed some sales plan of merit and discarded many that were fallacious.

The National Bottled Gas Association was conceived in the idea that all merchandising problems of bottled gas are general to everyone in the industry. By providing a forum for the discussion of these problems, more and better progress in the sale of bottled gas can be made. Trade associations are not in themselves a general specific for all trade ailments, but rather a clinic where disorders may be critically studied and proper remedies applied. The National Bottled Gas Association will concern itself primarily with those problems that affect the increased distribution of bottled gas.

This will be accomplished by the study of various methods of trade offerings, the manifold time payment plans, credit extensions on gas consumption, group advertising and technical study of appliances and equipment. The problems of gas production and equipment development are considered as belonging solely to the producers, and no effort will be made to enter this field of study. A national code of practices for marketing liquefied gases is now in committee and will be reported to the Association in New York at its January meeting.

Because of the very nature of the business, the distribution of bottled gas is not a one-time major sale, but a repetition of minor sales and the distributor therefore incurs an obligation to his subscribers of considerable extent. No one closely connected with the industry will object to the statement that bottled gas is critically eyed by prospective customers. Constant and unfailing service

must be rendered at all times. A weak member, no matter how small in size, can do untold harm to the industry as a whole. The National Bottled Gas Association hopes to be able to provide accurate information concerning merchandising of bottled gas that would not otherwise be available to the small distributor.

New Organization for Liquefied Gas Distribution in New England

New Hampshire Natural Gas Co., a new organization in New England, is asking for a score or more of franchises in New Hampshire for the service of liquefied petroleum gas.

Coos Gas Co., affiliated with New Hampshire Natural Gas Co., has already secured franchises in Berlin and Gorham, N. H., and is reported to be planning construction of central plants and distribution systems there. Headquarters for the latter company will be maintained at Berlin, N. H.

Consolidated Utilities, Inc., to Operate Plant at Flora, Ill.

Construction of a butane gas plant at Flora, Ill., has been started by the Consolidated Utilities Inc., of which A. J. Smith is president and treasurer. The plant at Mt. Vernon, Ind., which is soon to build, will be operated in the name of the North American Consolidated Utilities Inc., in which Mr. Smith holds the same official positions. These two plants were described in "Butane-Propane News" for November.

Philgas Co. Is New Name of Phillips Petroleum Subsidiary

A change of corporate name from Philfuels Co. to Philgas Co. was announced in November by G. G. Oberfell, president of the company, which is Phillips Petroleum Co.'s liquefied petroleum gas subsidiary.

There are no changes in financial interest, company policies, personnel, or location of offices, according to Mr. Oberfell.

Two Harbors Plant Scheduled For Completion Early in 1932

The butane plant being constructed at Two Harbors, Minn., by Roger O. Moore & Co., of Tulsa, Okla., will be completed early in the year. The plant will be owned and operated by the City of Two Harbors as a municipal project. About 500 consumers have signed up for service. Merchandising is being left to dealers, the City selling no appliances.

Using Liquefied Gas for Motor Fuel and as Refrigerant

The Shell Oil Co., from its San Francisco office, reports the discovery of a method for using liquefied petroleum gas simultaneously for refrigerating and powering refrigerated motor trucks. The liquid gas furnishes the cooling agent and then goes into the engine as a fuel instead of being re-compressed as in refrigerating systems. Invention of the process is credited to D. W. Davidson and F. G. Welks.

Asks Franchise in Ada, Minn.

Municipalities Gas Corp., Minneapolis, Minn., has applied for a franchise for the service of liquefied petroleum gas in Ada, Minn.

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LIQUEFIED PETROLEUM GAS

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TO MEET
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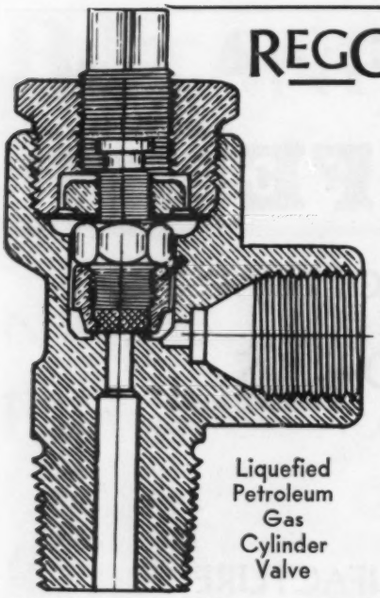

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Liquefied Petroleum Gas Cylinder Valve

a VALVE that *holds* Pet. Gas!

Here is the cylinder valve especially developed to hold the most volatile liquefied petroleum gas, under any working pressure and regardless of field conditions.

The RegO Cylinder Valve, engineered by the pioneers in Liquefied Petroleum Gas control equipment, is of the packingless diaphragm type . . . fool-proof, abuse-proof and free from faults. Hundreds of thousands of these valves are in constant daily use by practically all marketers of the wet or dry product.

If your present control equipment is not hundred per cent perfect in every respect, we shall be more than glad to have you put your problems up to us.

WE OFFER, FREE—

Every facility of this great organization is at your disposal . . . including all data on manufacture, distribution and sale of Liquefied Petroleum Gas. Write . . . ask us any questions!

The Bastian-Blessing Company

254 East Ontario St.

Chicago Illinois

The Psychology of Liquid

By A. N. KERR

PRIMARILY, liquid gas distribution is a job of salesmanship—and this applies to the central plant and bottled gas branches with equal force. Back of this sales problem are some intangible factors which Mr. Kerr deals with in his interesting article below.

A. N. KERR

The author knows whereof he speaks in this matter of liquid gas sales. Beginning in the production end of the industry, he has reason to believe that he was the first to manufacture dry gas, at Sisterville, in 1910—following Blau, who made wet gas in 1907. For the past several years he has been engaged in bottled gas distribution as president of the Imperial Gas Co. This firm, organized in 1925 as a subsidiary of Rockgas Products, has operated on the west coast with much success, its distribution area taking in British Columbia and the Territory of Hawaii as well as western United States. Since 1925 his company has placed 9,000 bottled gas sets in operation.—*Editor.*

FATE was unkind to liquid gas in 1910. She dropped the infant industry into the laps of engineers and manufacturers rather than into the hands of salesmen and servicemen.

The casinghead manufacturers (as we were then called) were a somewhat too rational lot, and men of action. Money came fast and went fast. Money bought results in casinghead, and we were of the opinion that it would bring results in liquid gas. We dealt with engines, pressures, facts, figures, daily input, daily outgo, production, and profit. At many of our plants our profits were in hundreds of dollars daily.

Imagine then our embarrassment, to find that liquid gas, our pet child, was not like that! We stepped from the world of tangibles into the intangible world of the mind, the world of selling, diplomacy, tact, a world where at times great effort went into convincing our customers, after they had used our gas, that they had used it at all!

Before we got our bearings many thousands had gone where good dollars go, and we began to see that we had much to learn. We still have much to learn. If you wish to find the wisest man in this business, consult the man who has just made his first "survey."

Because the business is peculiarly one of the mind, let us review for the moment the antics of the human "think tank" on its approach to liquid gas. For liquid gas, as compared to other gases, must be sold roughly at the prices below:

Natural Gas.....1c to 3c per lb.
(One M equals 48 lbs. condensed)

Artificial Gas.....4c to 7c per lb.
(Inflammable part)

Liquid Gas .....6c to 15c per lb.

This fact of the higher price makes it necessary to serve liquid gas with great discretion. Only experts should be trusted with its sale, provided all the customers are to be kept satisfied.

The Producers "Set" Idea

Liquid gas was greatly retarded in the early days by a "set" idea. When we approached the casinghead manufacturers for a supply we were met with the calm statement that "liquid gas costs as much to produce as gasoline." No allowance was made for the lighter weight of this thin liquid nor for the fact that it was a by-product. This price was first 15c, then 10c, then 5c. All down the years they have made the same statement. They did little to aid the pioneers. They preferred to waste gas at 20c per gallon rather than sell it for 10c. It was very unfortunate that liquid gas could be measured by the gallon.

Psychology of the Large Distributor

The large distributor is usually actuated by a vision. A survey of the territory will usually show a great many thousands who do not use gas. He can see no reason why he cannot sell them all within a season.

The new-comer's first thought seems to be that mountain and lake resorts will afford the best market. The fact is that mountain and lake resorts are usually unprofitable, just as other intermittent users are unprofitable to any gas company. Fifty pounds of gas will run the average mountain cabin a year. Our women folks do not go to the mountains to cook. In fact the modern cook stove is shrinking in size and is constantly being used less and less by the modern housewife.

When the large distributor counts up his prospects by the thousands he makes no distinction between the mental attitudes of the farmer's wife and the suburbanite. The city woman who has moved to the country will use gas, but the farmer's wife is not gas-minded. In addition she thinks she cannot afford gas. Farmers' wives train themselves to be careful spenders, as their income in cash is not large, although they may be worth considerable money. Most large distributors forget also that the time element in selling gas is far more important than money.

In other ways, too, the new distributor is blind to his problems, knows next to nothing about several hundred gas appliances, which the customers will insist on using with his gas, and very little of the dangers of application within the house.

Incidentally, the larger distributors who are building butane plants have so far shown another peculiarity of the mind as applied to mechanical design. This peculiarity is a natural one and exists in most plant designing. The mind seems reluctant in taking the short steps which lead directly across all the problems which first arise in new designs. Thus it is difficult to think out the simple solutions at first. There seem to be many reasons why complicated designs must be used. The early Greeks, for instance, built small steam turbines, but Watt and his friends turned from this idea first to the simple expansion engine and finally to the massive and intricate quadruple expansion steamship of 30 years ago. Later Parsons returned to the steam turbine and simplified the power plant. This process seems to be taking place in the butane plant field and

Gas Sales

President
Imperial Gas Company, Long Beach, Calif.

more simple designs are being used. In engineering as well as in life, simplicity is the essence of success.

Psychology of the Smaller Distributor

The man who distributes the liquid gas locally is helped a good deal by a glittering generality. Arriving at the customer's home he probably announces that he can serve the housewife and the home with gas "just the same as" their nearby neighbors in the big city. Unfortunately the customer takes this statement literally, and in the beginning neither the distributor nor the customer make a proper distinction between natural gas at 2c per lb. and the liquid gas at prices ranging from 6c to 15c per lb. The feelings of both are often hurt by the results. Good salesmen are usually persons who are very enthusiastic. Thus they insist upon first serving gas to pressing machines, space heaters, and large restaurants. They hope to sell a lot of gas in a short time, rather than take on the cooking load in the home, a load they can serve satisfactorily and without too much complaint if they are wise enough. Thus the distributor meets all his big problems at first. The electric companies also have these same problems in an acute form when dealing with large installations. They at first built a good many poor electric stoves, and made the mistake of charging a flat rate for the current they used. The bills were so high and they had so much trouble that they have not yet lived it down. People will say, "Electricity costs too much to cook with—yes, gas is cheaper." This is one of the fixed beliefs which affords our competitors one of their mental hazards to get over.

After their first mistakes, which were just as bad as anyone has committed in liquid gas, they manufactured better stoves and put in psychological rates. By raising the price charged to 6/7 of their customers and using this money to present heat to the wasteful 1/7 (as will be explained hereafter) they were able to eliminate most of the bitter complaints.

At the present time the electric company in a territory like Southern California finds itself much in the same position as the railways with respect to trucks. They are only one company against several aggressive liquid gas companies and the very quantity of the competition against them is effective. The question of our competition with the electric companies, which once frightened us badly, has rather been forgotten, and while they are a powerful competitor most customers will take the gas because of the easier cost of installation and the faster service. In addition, when natural gas lines do come the customer does not have to take a backward step to use the cheapest and best fuel available.

Psychology of the Customer

When the customers see the tanks they never visualize the supply being as good or as great as it is. They are incredulous. We have found that where gas is offered at the same price per pound in a small town

"STANDARD"
BU-GAS
A COMMERCIAL BUTANE OF EXCEPTIONAL PURITY

The high calorific value of Bu-Gas and its comparatively low vapor pressure result in economical storage and adapt it particularly—FOR GAS MANUFACTURE OR ENRICHMENT—FOR PEAK LOAD PRODUCTION

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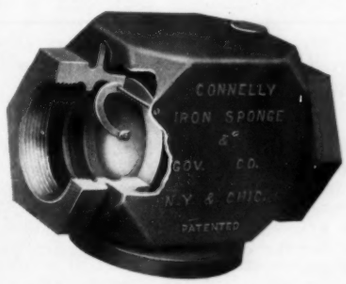
Gas Screens
Gas Tape
Combination Valve
Caloroptic Calorimeter
Counter-Balance Man Hole Cover
Safety-Syphon Seal



BACK PRESSURE VALVE
1/2" TO 36"
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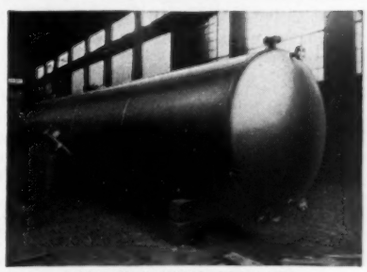


WELDED BUTANE RECEIVERS

BIGGS Welded Butane Receivers effect a real economy by eliminating the maintenance trouble and expense usually encountered under severe working conditions. The Biggs weld is ductile, uniform, and stronger than the plate itself. Data upon request.

THE BIGGS BOILER WORKS CO., Akron, Ohio

through a pipe line that the customers take to it much more readily. They consider a gas connection an asset to their property, while the same service from a tank is regarded lightly.

In using gas there are three broad axioms that seem to mean a good deal. They are as follows:

Axiom No. 1: Customers use gas until it hurts—No difference in what climate or at what price.

Their mental state seems to be agitated rather effectively when the gas bill touches the sum of $5. Years ago we were told in Louisiana that the above point of resistance operated to keep the gas bills the same as they were in Pennsylvania per customer per year. When the gas rate per pound goes up the customer uses more care, and vice-versa. Thus a thousand customers are good for about so much revenue, and no more.

Axiom No. 2: A small portion of the homes served, namely about 1/7, are operated by extravagant housewives or servants.

The odd fact about them is that in many cases they are quite sincere in the belief that they are economical. You would be surprised at the vehemence and ability with which they defend their economical use of the gas, yet they do not even sense economy well enough so that wasting gas makes any impression on their minds. They do not even know that they waste gas any more than they know what happens to their money. Accuse a saving person who is using liquid gas of such wastage and she will frankly admit it, stating that on last Friday she forgot the main burner for a time; yet the woman who admits this wastage is a satisfied user, while the woman who doesn't realize it is dissatisfied.

In placing a new customer on liquid gas service we think the best method is to make a frank statement in setting the outfit. We once said to a lady, Mrs. Linda Livingston, "Your neighbor, Mrs. Brown, has been able to mix some brains with her gas and has set up a very good record, having used a large tank for four months." With a gleam in her eye Mrs. Livingston replied that she could use a tank of gas as long as anybody else. We were pleased to find that a large tank lasted her 10 months. With three adults and two children in the family, the usage averaged only 21 pounds per month. This would do the work if not wasted.

Axiom No. 3: Every gas company has a certain number of customers with irritable minds.

All gas companies have complaint windows, and the controversies there are just as bitter where natural gas is selling for 30c as when gas is selling at higher prices. The constant reception of a gas or electric bill, however just and fair, is very aggravating to most people. We all remember the prisoner who was so tied in a cave that water would drop from the roof upon his wrist. This was a very little thing to begin with, but it caused his death.

On one occasion we had an argument with a very irritable man, telegrams poured in upon us, threats of court action filled the air. To be fair to this gentleman—he had some cause for complaint. He had been sold the outfit by one of these "once over" salesmen, who had stretched the point. Suddenly the complaints ceased and we were told by his wife that he had been very irritable on all subjects and had to be sent to an asylum. Retired business men with nothing to do are hard to please; if busy they would not complain.

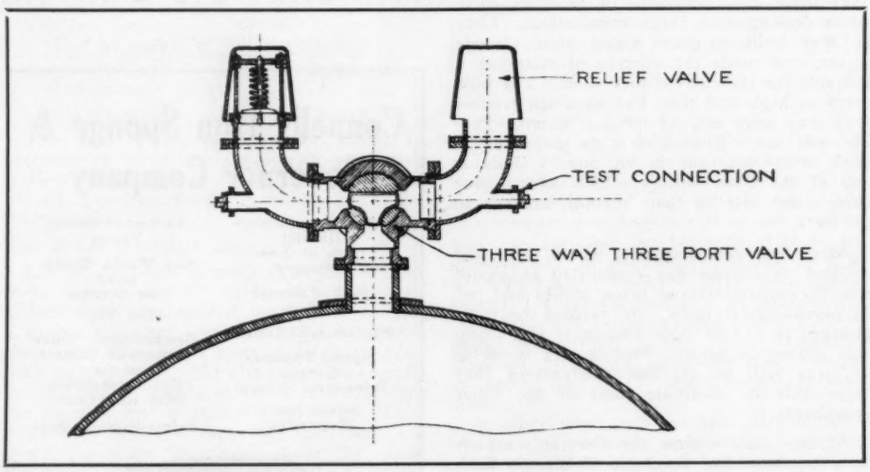
In connection with the above axioms we would say that Axiom No. 1 is again vindicated by the fact that home owners will use about 50 lbs. per month in southern California where the price will average about 7c per lb. In the mid-west the average is about 35 lbs. per month at an average of about 10c or 11c. In one form of outfit formerly sold in quantity the gas was charged for at 15c per lb., the burners were restricted in area and the monthly cost was not far from the usual average. After all then, the kind of gas, the condition of the range, the height of the burners are all minor matters compared to the great outstanding fact that most gas is wasted by the customer, who will continue to waste it up to the point where it costs him more than he thinks it should.

Customers who are chronic kickers are not very good accounts to have and if they come flying over to us because they do not like their electric bill, this does not make their natures any more gentle and workable for us to deal with. This is the first time in history when gas customers may have a choice of different services. It is upsetting to the trade who supply them, and the results can only be found by waiting to see what the future will reveal. Capital investments in railroads, power lines, factories, are all becoming less permanent as the tempo and speed of mechanical and electrical change and improvement upsets one industry after another. We assume that liquid gas may have its readjustments to make, too. We have been watching it for 21 years and still do not feel that the infant industry is old enough to look very much like it will look at maturity.

Relief Valve Connections to High Pressure Storage Containers

R. J. HORN, superintendent of the gas operating division for the Central Hudson Gas & Electric Corp., contributes to "Butane-Propane News" the following interesting description of relief valve connections which are in use by his company on the liquid butane storage tank at the Catskill, N. Y., butane gas plant:

"By using a three-way, three-port lubricated plug type valve as a yoke fitting, provision may be made (as is shown in the sketch) for placing either of the pop safety valves on storage pressure vessels out of service for repairs or testing. The three-way valve is so constructed that it is impossible to close off both of the relief valves at the same time, thus providing relief to the storage tank at all times. Normally both relief valves are in operation. This arrangement should be equally suitable for use on high pressure gas or liquid storage vessels."



Carrollton Gas Co. Buys Franchise Rights in Three Kentucky Towns.

It is reported that Carrollton Gas Co. has purchased gas franchises in the towns of Carrollton, Ghent and Warsaw, Ky., from the Switzerland County Utilities Co., Inc., headquartered at Carrollton, Ky. Franchises rights were granted the Switzerland County company for the distribution of liquefied petroleum gas.

S. E. Crowther Manager at Port Angeles, Wash.

S. E. Crowther, manager for the Natural Gas Corp. of Oregon, at Coquille, has been named manager for the Natural Gas Corp. of Washington at Port Angeles, Wash. O. Garver will take the managership at Coquille, Ore.

Geo. Watson of San Bernardino Constructing Indio Plant

A liquefied petroleum gas plant and distribution system is under construction in Indio, Calif., by Geo. Watson of San Bernardino. The gas will be supplied by Lomita Gasoline Co., of Long Beach, and contract for its delivery to the Indio plant has been awarded to R. H. Sikes and J. P. Key.

West Coast Gas & Fuel Gets Auburn and Placerville Permits

West Coast Gas & Fuel Co., San Francisco, has been granted permission to serve liquefied petroleum gas in Auburn and Placerville. Certain conditions were stipulated in the permit granted by the California Railroad Commission.

Gas Use in Steam Pumping Plants

(Continued from Page 31)

From the above it may be seen that 1,000 cubic feet of gas are producing the same results as 8.31 gallons of oil, or, in more familiar terms, 5,054 cubic feet of gas are doing the equivalent work that a barrel of oil did.

The Central Pumping Station at 19th and Sloat Boulevard, San Francisco, is the most modern steam pumping plant of the system. The present turbine driven pumps were installed in 1927 and no effort has been spared in making this station the ultimate in appearance and design. Reference to the accompanying illustrations will show the beauty of the architectural design and the finish given to the interior of the plant. There are two turbine pumping units, one operating at a time, each having two Ingersoll Rand centrifugal pumps in tandem, one boosting the delivery from the other, rated at 6,250 G.P.M., at 240 feet of head, with 1500 R.P.M. Each unit of two pumps is driven through reduction gearing by a condensing turbine, rated at 900 H.P. with 5,010 R.P.M. at 170 pounds per square inch. A condenser of the typical waterworks type, wherein the entire water pumped is used for cooling, is located in the suction line to the pumps. Condensate at 80° F. is pumped into an open feedwater heater, into which the jet pumps, and the exhaust from the boiler feed pumps and a small station generating unit, are discharged. From the heater it emerges at 148° F., is pumped into an economizer, from whence it enters the boiler at 195° F. Steam is supplied to the turbines at 183 pounds per square inch gauge, with a total steam temperature of 500° F. Jet pumps are used for exhausting, and a vacuum of 28-29 inches maintained consistently. There are three 150 H.P., H.W.T. boilers, two of which are in use at a time. The application of gas firing to these boilers was rendered somewhat difficult due to the high ratings per unit of firebox volume which were expected to be developed, and the fact that the stack, for esthetic reasons, only projected a few feet above the low roof of the station. In addition, the poor draft attainable with this stack was further cut down by the losses through the economizer, which while raising the overall efficiency of the plant, yet limited the maximum rating obtainable. The problem was handled by using Webster radiant gas burners slightly larger than those nominally rated and replacing the standard 5/32-inch spuds with spuds having 1/8-inch drilling. With burner pressures of 1-3 pounds no difficulty is experienced in developing excessive ratings at high efficiency. Each boiler has the hollow floor construction previously described, and each is fired by one Type 7-AX Webster radiant gas burner, equipped with 1/8-inch spuds. Gas supply is controlled by a 3-inch Wilgus gas fuel regulator. Opening and closing controls for the louvres, automatically actuated by gas pressure, are provided.

Combustion efficiencies for the boilers from Orsat tests, revealed 80 per cent combustion efficiency for the boilers alone, whereas stack samples and temperatures at the outlet of the economizer disclosed a maximum combustion efficiency of boiler and economizer, as a unit, of 85 per cent. Samples and temperatures of the gases in the last pass of the boiler showed an analysis of 11.0 per cent CO_2, 2.0 per cent O_2, no CO, with a temperature of 550° F., while stack temperatures, at the outlet of the economizer, varied from 260° F. to 290° F., and samples taken at the same points simultaneously, analyzed 9.0 per cent CO_2, 5.8 per cent O_2, with no CO, showing remarkably small air leakage through economizer. The "combustion efficiency" referred to above, is the percentage of the gross heat input to the furnace (gross B.t.u. in gas entering furnace) which is utilized in heating water, generating steam, and making up radiation losses from boiler, economizer, and settings. In common with most pumping plants the load was remarkably steady and the results above are those which obtain during a majority of the time. Station duty on this plant varied somewhat due to the inherent characteristics of the centrifugal pumps, being 85,900,000 foot pounds per 1,000 cubic feet of gas on March 20, 1931, while pumping 7,397,000 gallons during the 24 hour period. Taking a lower load, on April 22, 1931, the duty was 85,050,000 foot pounds per 1,000 cubic feet of gas, while pumping 6,566,000 gallons. Duty with oil varied from 10,483,000 foot pounds per gallon of oil, on August 6, 1930, while pumping 6,339,000 gallons, to 11,405,000 foot pounds per gallon of oil, on July 4, 1930, while pumping 6,440,000 gallons per day.

In the case of the above plants gas has reduced operating and maintenance costs to a minimum, removed the necessity for frequent soot blowing, and cut down the amount of make-up water due to the elimination of steam atomizing. A considerable reduction in fuel bills has also characterized the operation with gas fuel. No automatic stack damper controls were applied, the inspirating characteristics of the burners being used to maintain proper combustion after the dampers had once been set. At the Central Pumping Station, the louvres on the Webster radiant gas burners assume the duty of maintaining the proper proportion of air and gas.

In conclusion it would be well to state once more that the figures given above represent general average practice in these plants, and in no sense are to be construed as approaching the duties that are possible under test conditions. While test results would be of value for guarantee purposes, their usefulness in giving an overall picture of normal service, including auxiliary losses, is extremely limited. Consequently, the performances given, while not spectacular, are presented in the hope they will appeal to those who are interested in knowing what they can expect of gas-fired, steam pumping plants operating under ordinary conditions.

Belmont Pumping Plant of San Francisco Water Department—1,300 rated horse power fired with Webster Radiant gas burners and automatic fuel control with Wilgus gas fuel regulator.

Franchise at Billings, Okla. Granted to Wash Whitlow

Citizens of Billings, Okla., November 17, granted a 20-year gas franchise to Wash Whitlow, local citizen. A flat rate of 55c for the first thousand cubic feet and 50c per thousand on the additional is named in the franchise. The Billings Gas Co. is now distributing gas in Billings.

Owatonna-Rochester Line to Get Under Way Immediately

Contracts have been let for an additional 40 miles of 12- and 10-inch pipe line from the Mason City-Owatonna line to Rochester, Minn., to serve gas to the Franklin Heating Station, and to the Rochester Municipal Light & Power Co. Work on the line is scheduled to begin immediately.

Valley Exploration Co. Gets 35,000,000 c. f. Well

Valley Exploration Co., subsidiary of Pacific Gas and Electric Co., San Francisco, in November brought in a well in the Dudley Ridge area, Kettleman Hills field, estimated to have a production of 35,000,000 cubic feet per day.

The new Ambassador heater, shown on the left, is an adaptation of the Humphrey gas unit heating principle of fan-forced circulation and combustion.

The New Humphrey Amdassador

THE Humphrey Ambassador Heater was recently announced by the General Gas Light Co., Kalamazoo, Mich. The new Ambassador is an adaptation of the Humphrey gas unit heating principle of fan-forced circulation and combustion. All the mechanism—radiating elements, motor, fan, gas lines—has been concealed in a cabinet, designed to blend with home or office furnishings.

Temperature is maintained by an automatic electrically operated thermostat located near the room air intake grille. It is equipped with safety pilot valve, which in case pilot is extinguished, automatically cuts off gas to burner as well as to pilot. Sides and top of the cabinet are constructed of heavy gauge sheet steel and are shielded as a safety measure.

The new appliance is designed either as supplementary to the central heating system or as an individual space heater for homes, offices, stores and shops.

Insulation for Natural Gas Piping

(Continued from Page 22)

this decrease in absorption occurs somewhere between 2040 and 4096 vibrations per second.

The absorption and transmission of sound vary with the thickness of the absorbing material, but not in direct proportion. For example, tests made in acoustical treatment of buildings have shown that the intensity of the sound decreases according to the exponential law $St = Se\ A^{-x}$ where Se and St are respectively the sound that enters and is transmitted by the material, A is a constant and x the thickness of the material. Nashkote A at a frequency of 512, which is one octave above middle C, has the following absorption coefficients, ½ inch thick 0.25, ¾ inch thick 0.27 and 1 inch thick 0.33.

Perforating some absorbing materials with small holes approximately three-fourths of the way through the material permits the entrance of more sound waves into the material and increases its absorption value. In the case above, the perforations give the following results: ½ inch thick 0.43, ¾ inch thick 0.51, and 1-inch thick 0.58.

Materials are also made with a metal or hard perforated face and a soft absorbing substance in back of it. The sound waves enter the perforations and are absorbed by the material. The Burgess muffler used in automobiles is an example of this principle.

The selection of a material for pipe insulation should depend upon its absorbing qualities, the frequency of the sound and where it is to be installed. In a dry room either hair felt, Banrock, or some similar material could be used, but the hair felt and many other materials would not be satisfactory in a damp place or where they are exposed to the weather. Banrock, however, being made of stone, is not affected by dampness, is fireproof and not subject to deterioration because it has no free lime content. Some rock wools have a lime content.

Table No. 1 gives the absorption coefficients for a few materials at various frequencies.

In order to eliminate the noise produced at the Milpitas Meter Station, it was decided to install granulated Banrock around the pipe, meters, etc. Tests showed the vibrations to be approximately 656 per second.

The installation consists of a tongue and groove box built in 5-foot sections around the pipe. Each side is built as a separate unit and they are bolted together in such a manner that any one of them may be easily removed. Segments made of wood are placed around all flanges and at the end of each section or approximately every 5 feet along the pipe to support the housing. A clearance of about 6 inches is allowed around the pipe and the space is filled with Banrock tamped in to about 15 pounds per cubic foot of space. Drain holes spaced 2 feet 6 inches are bored in the bottom to allow any moisture to seep out and vent holes are placed along the sides near the top to allow for circulation of air. These holes are bored at a slant screened on the inside and protected from the rain on the outside with flashing.

Before the installation of this Banrock, with the regulators in or the valves throttled, the noise was so great that it was almost impossible to use the telephone in the office nearby, but now there is practically no noise. This could have been further eliminated if it had been possible to completely insulate the gears on the plug valves.

I believe just as good, if not better results could be obtained by installing a housing around the pipe as described above and lining the housing with an absorbing material leaving an air space between the pipe and the insulation. While the Banrock, being in contact with the pipe absorbs most of the sound, the fibres may act as a better conductor than the air space. Also insulation between the wood segments supporting the housing and the pipe would help to further eliminate the sound.

TABLE NO. 1.

Material	Thickness	Frequency 256	512	1024	2048	4096
Banrock	1¼ in.	.....	0.57	.....	.....	.....
Brick		.....	0.025	.....	.....	.....
Concrete		.....	0.015	.....	.....	.....
Glass	Single	.....	0.027	.....	.....	.....
Hair Felt	1 in.	.....	0.58	.....	.....	.....
Wood Sheathing		.....	0 061	.....	.....	.....
Cork Tile	1⅛ in.	0.13	0.33	0.42	0.42	0.15
Lime Plaster on Wood Lath		0.024	0.034	0.030	0.028	0.043
Nashkote AX	1 in.	0.34	0.69	0.80	0.59	0.49
Ozite	¼ in.	0.10	0.13	0.25	0.37	0.47
Perforated Metal over 2" Hair Felt		0.53	0.81	0.63	0.58	0.52
Rock Wool Blanket	1 in.	0.40	0.56	0.65	0.68	.....

Safety Meeting for Northern Natural Employees in November

A series of safety meetings was held for Northern Natural Gas Co. employees under the direction of J. W. Kelso in November. The first meeting was held November 3, in Lincoln, with 24 employees attending. Eight meetings were held in all, at West Point, Neb.; Fort Dodge, Iowa; Atlantic, Iowa; Beatrice, Neb.; Clifton, Greensburg and Mead, Kan.

City of Long Beach to Have Raise in Gas Service Rates

The city council of Long Beach, Calif., has voted an increase in rates charged by the city for natural gas service. The additional revenue will be used for adding to the city's distribution system, and is estimated at about $50,000 per month.

The WORLD'S LONGEST GASOLINE LINE

Great Lakes project involves 1400 miles

THE longest gasoline line in the world is that of the Great Lakes Pipe Line Company, recently completed, leading from northern Oklahoma points and El Dorado, Kansas, through Kansas City to Des Moines and branching from the latter north to the Twin Cities and east to Chicago. South of Des Moines another branch extends to Omaha. A total of 1400 miles is involved and 27,500 barrels per day is the estimated capacity. It has twenty-one pump stations at intervals of approximately fifty miles. Terminals and blending stations for Ethyl gasoline are located at Kansas City, Des Moines, Chicago, Twin Cities and Omaha. The system has its own telegraph and telephone lines from end to end and also teletype equipment like that used for the transmission of news to metropolitan newspapers.

Six oil companies united in the Great Lakes enterprise and are sharers in ownership of the line. Numerous firms of contractors were employed in laying the line and in building the pumping stations. Altogether this was one of the outstanding pipe line projects of the year and with additional extensions contemplated, the line will serve an unusually large area.

For this very important undertaking the pipe used throughout, was NATIONAL—

America's Preferred Line Pipe

NATIONAL TUBE COMPANY · PITTSBURGH, PA.

Subsidiary of United States Steel Corporation

NATIONAL PIPE

Ethyl Mercaptan for Locating Leaks

(Continued from Page 30)

From experience gained in the town previously odorized with Ethyl Mercaptan, we concluded that the first few days with light concentrations were of little value and merely served to bring in leaks around consumers' equipment. To eliminate the necessity of these few days with light concentrations of Ethyl Mercaptan it was decided to increase the intensity of our regular Cal-odorant No. 3 prior to the time of injecting Ethyl Mercaptan. For two weeks prior, Cal-odorant was used in concentrations of 15 gallons per MM.c.f. and in this manner a number of small leaks around consumers' equipment were located and repaired before the injection of Ethyl Mercaptan.

The arrangement of the distribution system permitted sectionalizing into four divisions so each section could be odorized as a separate distribution system. This was a distinct advantage, not only keeping down the number of appliance complaints, but also permitting concentration of our men in one section.

Each section was odorized four days with Ethyl Mercaptan in concentrations of 50 lbs. per MM.c.f. and the usual procedure followed of patrolling the streets and smelling for leaks around service risers, water meter boxes, manholes and catch basins. Odorant was injected only between the hours of 5:00 a.m. and 9:00 p.m. as no patroling was done before 5:00 a.m. or after 9:00 p.m. It is interesting to note that our best hours for locating leaks were between 7:00 and 9:00 p.m. and 5:00 and 7:00 a.m. During these hours there was practically no breeze and the odor of Mercaptan could be more quickly detected. A total of 51 underground leaks was located, and a number of these were serious. Most of these sub-surface leaks were under concrete pavement, which indicates that even under these conditions the use of Ethyl Mercaptan is effective.

A summary of activities in this second town gives the following:

Total days odorant used	8
Rate of odorant injection	50 lbs. per MM.c.f.
Number of meters	1050
Total number of leaks	405
Main leaks	13
Service leaks	38
Meter and regulator leaks	68
Appliance and piping leaks	286
Unaccounted-for prior to test	2000 M.c.f. per month
Unaccounted-for after odorant test	900 M.c.f. per month

Very few unfavorable reactions were indicated by consumers.

Conclusions

The following recommendations are made from experience gained during these two tests:

1. Odorize gas with heavy concentrations of Cal-odorant No. 3 for several days prior to injection of Ethyl Mercaptan.

2. Divide distribution system into sections as small as practical.

3. Use Ethyl Mercaptan at rate of 50 lbs. per MM.c.f. Light concentrations are of little value for underground leak detection. Odorant should be discontinued during late night and early morning hours.

4. Particular attention should be given street patrol during hours when atmosphere is quiet, possibly after sundown and before sunup.

5. Tests should be made during warm weather, as house leaks will cause less annoyance to occupants at that time due to better ventilation.

6. Employees should be instructed in proper explanations to give the public. A brief, concise statement is thought better than a long, detailed explanation.

There is still a doubt as to whether or not consumers should be notified in advance of making such a test. Some customers commented on the fact that they had not been notified. Up to the present time it has been thought that a notice to consumers would only serve to increase the appliance complaints which are always a burden at the time of the test. Such appliance leaks as are not reported when the gas is previously odorized with Cal-odorant would be of very small size and could probably be passed up without any hazard. If this reasoning is correct, then any advance publicity which would increase the number of appliance complaints would only increase the amount of work without being of material benefit.

It is not intended to convey the idea that Ethyl Mercaptan is the marvelous panacea for disclosing leakage in distributing systems. Its use means a congestion of work for a short period and every complaint must be handled with particular tact to put over the idea that the consumer is not being unnecessarily annoyed. Despite the objections, the advantages seem to more than offset the disadvantages and from our experience, we believe the temporary use of Ethyl Mercaptan is an economical and effective means of detecting underground leakage.

Specify
WALWORTH
VALVES
FITTINGS
for AND TOOLS
GAS
WALWORTH
General Sales Office
60 E. 42nd St., New York
WALWORTH CALIFORNIA CO.
235 Second St., San Francisco
WALWORTH COMPANY
809 Fourth Place, Los Angeles

Anticipating Mid-Winter House-Heating Demands

Gas company advertising copy written around the theme of greater heating needs during the fall and winter months is again finding its place in various advertising media. That bills will be higher during the months when high winds, freezing temperatures and rain make more heating necessary, is common information, but gas companies are becoming mindful that this fact must be more forcefully brought before the average consumer.

For comfort you need
2 times more heat in January than in November
HUNDREDS of our customers are saying, "NATURAL GAS for cooking, water heating and house heating during October, November, and December, 1930, COST LESS than cooking and water heating with gas and HOUSE HEATING WITH OTHER FUELS during the same period of 1929."
Naturally, it takes more fuel to heat your home in January. For that is the coldest month of the year.
So it doesn't matter what fuel you may be using or whether you pay for it monthly or at the beginning of the heating season, facts prove that during January you must have more heat.
With Natural Gas heating, you pay for the fuel each month after using it. Therefore, the logical way to look at the cost of gas heating is the average monthly cost or the total yearly cost.
Because we have no way of separating the gas you use for heating from that used for cooking and water heating, all gas consumed is shown on the same monthly bill. However, every one knows from experience during months when no gas is used for heating about what the bill for cooking and water heating will run. We suggest that you deduct the cost of gas for cooking and water heating when estimating the average net monthly or yearly cost of gas for house heating.
If the cost of Natural Gas is figured in this manner, it will be found that warmth and comfort with gas heating equipment is most economical. Furthermore, Natural Gas is the cleanest and safest fuel you can use.
The percentage of heat needed each month. Compiled from facts published by the U. S. Weather Bureau.
Example 5-room home and 6-room home
Total yearly gas bills for 6-room home in San Mateo using gas in Warm-air Furnace, for Cooking and Water Heating . . . $160.00
Estimated monthly average cost of gas for cooking and water heating. $4.50 X 12 . . . 54.00
Estimated YEARLY cost of Natural Gas for heating only . . . $106.00
Estimated average MONTHLY cost of Natural Gas for heating . . . $8.83
Actual bills from 6-room home in Burlingame with Warm-air Furnace figured as above and using $2.50 as monthly cost of cooking and water heating, shows estimated monthly cost of Natural Gas for heating alone to be . . . $4.33
Natural Gas is the most economical fuel for complete heating comfort.
For Natural Gas heating equipment see a DEALER or the
PACIFIC GAS AND ELECTRIC COMPANY
P · G · and E ·
Owned · Operated · Managed by Californians

Gas companies are becoming mindful that this fact must be more forcefully brought before the average consumer.

The advertising copy reproduced here, employed in Pacific Gas and Electric Co. advertising during the months of the 1930-1931 winter season, brought its consumer-public face to face with concrete facts concerning their January heating requirements.

New Head for Missouri Valley P. L. Co.'s Legal Department

R. J. Organ has been named to head the legal department of the Missouri Valley Pipe Line Co., with offices at Omaha, Neb. Geo. A. Lee, general counsel for the company, maintains his office at Lincoln, Neb.

House Heating Featured in Gas Appliance Week in Tulsa

A gas appliance week featuring gas-fired heating equipment was celebrated recently in Tulsa, Okla., with Oklahoma Natural Gas Corp. and 21 appliance merchants of Tulsa participating.

Oklahoma Natural sponsored a mass display of appliances in the offices of the corporation, while individual displays were shown in the stores of the participating dealers.

The gas company's staff of heating engineers was on hand to explain heating difficulties and assist in selecting the proper appliances and in adjusting those already installed.

A heating school is being conducted by Oklahoma Natural in the interest of acquainting dealers with the solutions for house heating problems. The school is conducted in an informal manner with officials of the company addressing the meetings. Thirty-seven were in attendance at the first session, 10 of whom were company employees.

The main purpose in conducting the school is to create a cooperative spirit among the various trades allied in the interest of up-to-date house heating, and to raise the standard of efficiency in the installation of this type of equipment.

Cities Service Gas Co. Has Interesting Display at State Fair

At the recent Kansas State Fair in Hutchinson, Kan., the Cities Service Gas Co. had an interesting display. Before a large map of the company's Kansas distribution system was arranged a group of gas appliances, including the new Columbus gas furnace, space heaters, radiant-type heaters and various other gas appliances. Another feature of the display was a map on which was shown the location of gas fields from which the Cities Service Gas Co. obtains its supply.

Ohio Oil Co. Secures Franchise to Serve Craig, Colo. With "Natural"

Ohio Oil Co., Casper, Wyo., was recently granted a franchise for the service of natural gas in Craig, Colo., and will serve the town from wells three miles distant if the test well which the company is now drilling is placed on production. The line to Craig would be of 4-inch pipe, and would serve approximately 300 customers, according to word received from John McFadyen, president of the company.

New Gas Field Reported in Central Wyoming Territory

Location of a new gas field was reported in Fremont County, Wyo., recently, when Ward Oil & Gas Co.'s wildcat test well in Dutton Basin came in unexpectedly as a gasser with an open flow of approximately 10,000,000 cubic feet. Dutton Basin is located about 18 miles south of Moneta and about 12 miles east of Muskrat.

Pacific Pipe & Supply Co. to Handle Inertol Products in Los Angeles

The Inertol Company, Inc., of New York City, has announced the appointment of the Pacific Pipe & Supply Co., Los Angeles, as southern California distributor for the Inertol line of steel and concrete protection products. Paul Dato, formerly with the Inertol Co., will continue with the Pacific Pipe & Supply Co. specializing in this particular branch of sales.

Electro Automatic Draft Control for Steam Boilers

(Continued from Page 23)

makes provision for shifting "balance point" in accordance with slight atmospheric variations, humidity, etc. Functioning to provide limited control of the output voltage of potentiometer for any given damper position, R_3 thereby constitutes a "micrometer" adjustment.

A variable resistance to control fan speed, where forced or induced draft blowers are present, is incorporated as suggested in section A-A, Fig. 2.

Operation, Delayed Automatic

To transfer to delayed automatic control, the 6 P.D.T. switch on the master panel is changed to lower position. This opens the relay coil circuits, and permits rotation of the damper shaft by push button manipulation.

A voltmeter is placed on the master panel across the output side of the potentiometer. As this voltage is a function of the damper position, it is apparent the instrument may be used as a damper position indicator. Once the optimum damper position-burner pressure characteristic is determined, the operator can utilize this instrument to favorably set a damper from a strategically located master panel.

Manual Control

By merely opening the 6 P.S.T. switch on the boiler panel, transfer to manual control is effected. The handwheel is then utilized to set the damper at any desired position. The manual control will be governed by such combustion-indicating instruments as are available, and firebox inspection.

Any boiler of a battery may be operated on any of the three forms of control, independent of the form in use by the others.

Motor Rating

The following test data were obtained to demonstrate the comparatively small amount of power required to actuate a representative damper.

At a lever arm of 3 inches, the force necessary to move the damper was found to be 60 pounds.

Hence, in one revolution of the damper shaft,

$$\text{Work} = (F)\ (2)\ (\pi)\ (r)$$
$$= (60)\ (2)\ (\pi)\ (3/12)$$
$$= 94.248 \text{ ft. lbs.}$$

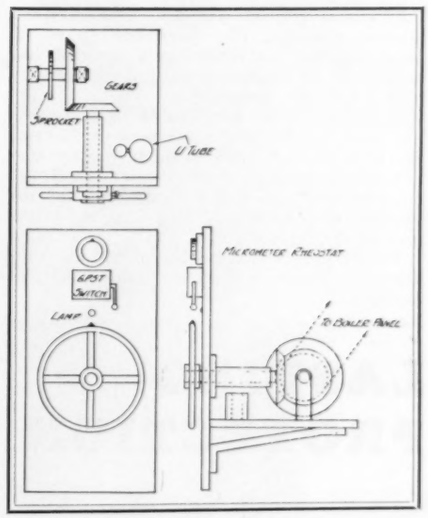


Fig. 3. Boiler panel

If the shaft were turned at the rate of N revolutions per minute,

$$\text{Power} = (94.248)\ (N) \text{ ft. lbs. per min.}$$

Let it be desired the shaft rotate at 2 r.p.m. Then, for 90° rotation,

$$\text{Time} = (90/360)\ (1/2)$$
$$= .125 \text{ min.}$$
$$= 7\tfrac{1}{2} \text{ sec.}$$

Also,

$$\text{Power} = (94.248)\ (2)$$
$$= 188.496 \text{ ft. lbs. per min.}$$
$$= .0057 \text{ H.P.}$$

To compensate for friction, temperature of location, and other influences, in this case a 1/15 H.P. motor would be recommended.

Conclusion

Existent A.C. or D.C. circuits may be utilized for power source. The system is unaffected by voltage fluctuations, as such variations influence both current coils in the same manner.

This paper does not attempt to consider more than a schematic description of the system. The design permits rugged, simple construction; delicate moving parts, such as cams, bourdon tubes, and differential springs are avoided.

Four Oklahoma Gas Companies in Merger

MERGER of four natural gas companies operating in Oklahoma was announced on November 7. The gas holdings of the Western Service Corp., Pioneer Gas Utilities Co., Oklahoma General Gas Co., all of Oklahoma City, and the Kingfisher County Gas Co. of Kingfisher, were consolidated into one company headed by T. F. Murchison of Dallas, Texas. Mr. Murchison is head of the Chicago investment house of Peabody and Co. and is president of the Southern Union Gas Co. of Dallas.

The new company will be known as Western Service Co. of Oklahoma, and is capitalized at $2,500,000. Earl R. Ernsberger, president of Western Service Corp., becomes chairman of the board for the new company.

Western Service Corp. owns franchises in Guthrie, Shawnee, Tuttle, Minco and Britton, Okla., is serving gas in Guthrie, and building a system in Shawnee, and also has holdings in Kansas and Missouri. Pioneer Gas Utilities Co. distributes natural gas in a suburban section of Oklahoma City; and McLoud, Harrah, Choctaw and Nicoma Park.

Oklahoma General Gas Co. serves Nichols Hills and Lincoln Park near Oklahoma City.

The Kingfisher County Gas Co. supplies gas to and distributes it in Kingfisher, Dover and Hennessey, securing its supply from the Lovell field in Logan County, Okla.

Beaty Elected to Head A. P. I. as President

THE 12th Annual sessions of the American Petroleum Institute, held at Hotel Stevens, Chicago, Ill., November 10 to 12, were reported as reflecting a general improvement in conditions within the industry with a brighter outlook for 1932.

Houston, Texas, was chosen as the meeting place for the 1932 convention on November 15 to 17, and Amos L. Beaty was selected to head the Institute as president. Mr. Beaty, a member of the board of directors of the Phillips Petroleum Co., was formerly treasurer of the Institute.

In addition to electing Mr. Beaty as president, the board of directors elected the following:

Vice-president at large, H. R. Gallagher, Shell Oil Co., San Francisco.

Vice-president for production, Charles F. Roeser, Roeser & Pendleton, Fort Worth, Tex.

Vice-president for refining, Daniel J. Moran, Continental Oil Co., Ponca City, Okla.

Vice-president for marketing, W. T. Holliday, Standard Oil Co. of Ohio, Cleveland, Ohio.

Executive vice-president, W. R. Boyd, Jr., American Petroleum Institute, New York.

Treasurer, Axtell J. Byles, Tide Water Associated Oil Co., New York.

Secretary and assistant treasurer, Lacey Walker, American Petroleum Institute, New York.

The board also voted to increase its membership from 67 to 72, and among others the following men identified with the gas industry were elected to the board: Frank Phillips, Phillips Petroleum Co.; Floyd C. Brown, Continental Construction Co.; Frank R. Coates, Henry L. Doherty & Co., and H. V. Foster, Indian Territory Illuminating Oil Co.

Frederick, Okla., Made Division Headquarters for Community Natural

Frederick, Okla., has recently been announced as one of the 15 division headquarters for the Community Natural Gas Co., Dallas, Texas. C. C. Moore, stationed in Frederick, is division manager over the territory, which will include several Oklahoma towns, including Hollis, G. C. Hollis local manager; and Walters, Earl Pinkerton local manager. Frederick was formerly one of the districts in the Vernon, Texas, division under H. L. St. John. Mr. St. John, formerly division manager at Vernon, has been transferred to Mexia, following the death of Arthur Warshauer, former Mexia division manager. G. P. Williams, stationed at Electra, is now Vernon division manager.

The distribution system at Cisco, Texas, recently bought by the Community Natural Gas Co., has been included in the Eastland division under F. V. Williams.. H. L. Dyer is local manager.

Louisiana Power & Light Co. Serving Three More Towns

Hammond, Ponchatoula and Slidell, La., received natural gas for the first time on October 30 through the mains of the Louisiana Power & Light Co., with operating headquarters at Algiers, La. Supply for the towns comes from United Gas System's lateral extending from the Yazoo City-Mobile line to Bogalusa.

Oscar Vittur has been named manager for the company at Ponchatoula; A. E. Elliott is district manager with offices at Hammond, and Travis Carroll, Jr., is manager in Slidell.

Celebrations were held in each of the three towns with McGregor Smith, vice-president and general manager of Louisiana Power & Light Co. a featured speaker.

Bulletin No. 70 by Fisher Governor Company on Type 4000 Regulators

Fisher Governor Co., Inc., announces the publication of Bulletin No. 70, covering the Fisher series Type 4000 pilot operated pressure regulators, for regulating reduced pressures, relief or back pressures, vacua, and for boiler pressure control by regulating the gas or oil fuel supply. The pilot valve in this controller involves a new adaptation of the Bourdon tube principle.

Sunnyvale Air-Base to Use "Natural" Supplied by P. G. and E.

The new government air-base at Sunnyvale, Calif., will use natural gas from the mains of the Pacific Gas and Electric Co., San Francisco. The company will tap the Kettleman Hills line and run about 2 miles of 8½-inch pipe line to the base. Cost of the connection is estimated at about $20,000.

Harrisburg Natural Gas Franchise

Harrisburg, S. D., voted late in November to grant a gas franchise to the Sioux Falls Gas Co., Sioux Falls, S. D.

LASTING PROTECTION

The extra years in the ground for pipe protected with NO-OX-ID defer the terrific expense of reconditioning. Inspections from year to year show the splendid condition maintained.

Consult with us on new or reconditioning work.

Dearborn Chemical Company
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IRON-RUST
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The Original Rust Preventive

A MERRY CHRISTMAS to the GAS INDUSTRY

MAY 1932
BE A
PROSPEROUS
YEAR

PACIFIC PIPE & SUPPLY COMPANY
1002 Santa Fe Avenue Los Angeles, California
Manufacturers of
PAPCO
Natural Gas Odorization Equipment
Orifice Disc Fittings Calibrated Meter Runs
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GROBLE REGULATORS & GOVERNORS

Complete Line of Regulators for

Natural, Manufactured, Butane and Propane Gas

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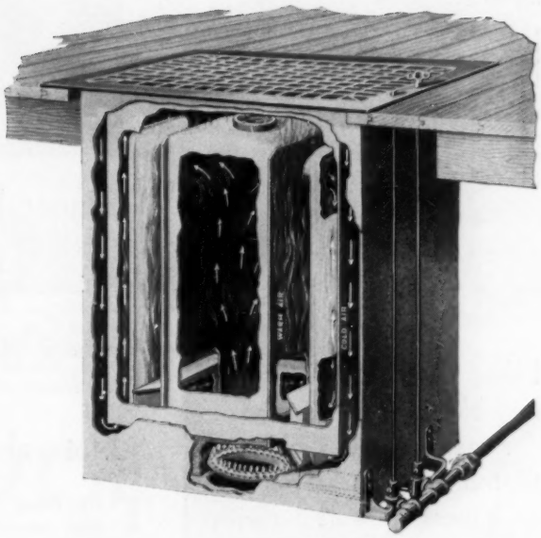
GROBLE GAS REGULATOR COMPANY
Office and Factory: Anderson, Indiana

Money Is Being Made *Right Now* with the Famous PACIFIC FLOOR FURNACE

Wide awake heating men are **replacing** defective furnaces instead of repairing them.

There's more money for you, better service for your customer, in a brand new PACIFIC FLOOR FURNACE. It will take no longer to install it than it would to repair an old furnace or other heating system, and you have paid yourself a real profit and done your customer a real favor.

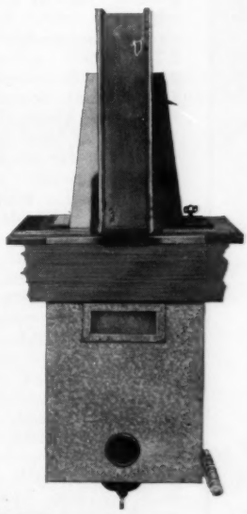
Winter weather shows up defective heating systems. Now is the time to sell Pacific Floor Furnaces and other modern Pacific Gas Appliances. Their first cost is moderate; they are economical to operate; they deliver the heating comfort your customers want.



Features that Make this Furnace Better, and Easier to Sell

1. Floor or wall registers in antique bronze or brushed brass finish.
2. Five large heat radiating surfaces (four sides and top) utilizing all heat in gas.
3. New method of casing construction, exclusive with Pacific, keeps casing cool at all times, and insures abundance of air to heating chamber for re-heating. **There is no heat loss through outer casing.**
4. Heating unit of 20-gauge pure ingot iron. Pressed and Welded joints are absolute insurance against leakage. Extra heavy cast iron dome super-heats air before it passes into room.
5. Raised-tip Bunsen type burners, with clean-drilled flame holes and soapstone tips. Long heat travel of burned gases and indirect method of venting allow hot gases to come in contact with greater radiating surface than possible in other designs.
6. Four sizes, to meet the needs of any type or size of building.
7. Adaptable to any type of modern electric or hand control.

Our Agency Proposition is Attractive . . . Write for Particulars on Your Locality



THE PACIFIC DUAL SYSTEM

Identical in quality and construction with regular Pacific Floor Furnace, but has two registers. Delivers heat into two rooms at once, or may be used in either room alone. Every Pacific Furnace is fully guaranteed in every detail of material and workmanship, with nearly 20 years of reliable dealing behind the guarantee.

Pacific Gas Radiator

Gas Heating Company Headquarters

Roseberry and Walter Streets
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Gas-Steam Radiators

Round Furnaces

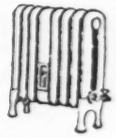
Dual Pipeless Furnaces

Fireplace Radiant Heaters

Recess Radiant Wall Heaters

Automatic Storage Hot Water Heaters

Pipeless Floor Furnaces


Gas Radiators—Pressed Metal and Cast Iron

Agencies Throughout the West

Call for a Pacific Heating Engineer

MANUFACTURERS *of* EVERY TYPE *of* GAS HEATING APPLIANCE

THE HIGH COST OF "ECONOMY"

False economy dictated perishable pipe for the above water main. Now the "saving" more than disappears, since it must be replaced with permanent (McWane-Pacific) cast iron pipe.

Gas mains, too, cost less per year when laid with everlasting pipe—cast iron. No coating or coddling — just PERMANENCE.

Cast Iron Pipe as Small as 1¼ Inch

Small mains for high-pressure service last without leaks when McWane-Pacific 1¼, 2, and 3 inch cast iron gas pipe is used. Special joints for every pressure.

Get booklet on Pacific pipe before you buy any pipe.

McWANE CAST IRON PIPE CO. BIRMINGHAM ALABAMA

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KANSAS CITY 1006 Grand Avenue
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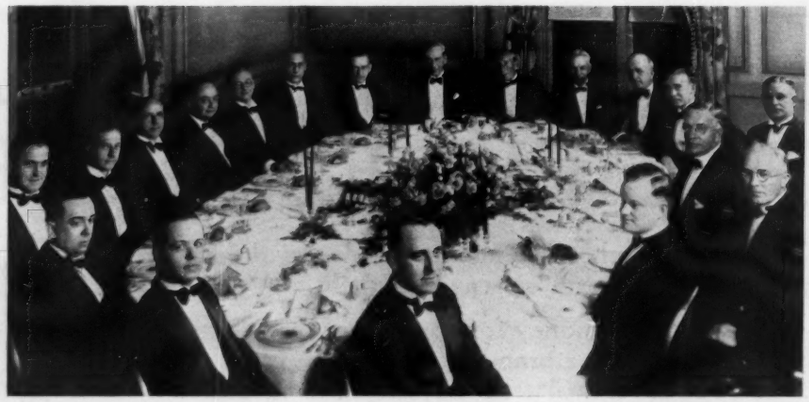


Dinner Honors Ruud Manufacturing Co. Associates

THE Ruud Manufacturing Co. held a dinner in Pittsburgh, Pa., on October 24, commemorating the 25th anniversary of the association of H. R. Basford of San Francisco and C. E. Bartlett of Philadelphia with the company. Presiding at the head of the table was Edwin Ruud, president of the company. Seated near him were A. P. Brill, general manager of the company; Herbert Humphrey of the Humphrey Division; George Egleston, and other officials and department heads of the company.

As a token of appreciation for their long years of service Mr. Basford and Mr. Bartlett each were presented with a silver loving cup.

Natural Gasoline Production Declines in 1930

THE trend of natural gasoline production, consistently upward since its beginning, showed a marked reversal in 1930, when the output failed to surpass the 1929 total. The production in 1930 amounted to 2,210,494,000 gallons as compared with 2,233,688,000 gallons in 1929, a decrease of 1.0 per cent, according to the United States Bureau of Mines, Department of Commerce. In spite of this decline, the United States still ranks far ahead of the other nations in natural gasoline production. In 1929, the latest year for which complete world figures are now available, the United States produced 91 per cent of the world total. However, the proportion produced by the other countries, while small, has grown steadily.

Natural gasoline production is influenced chiefly by the output of crude oil, and since 1930 crude output was considerably below the record total of 1929, the production of natural gasoline at the majority of those plants which operate on "wet" or casinghead gas was reduced. On the other hand, the demand for natural gas to supply the large pipe line systems increased in 1930, and since this gas is usually treated before it is turned into the pipe lines, the output of natural gasoline rose accordingly. Thus the increase in production of natural gasoline in the Texas Panhandle area, the point of origin for a number of large pipe lines, largely compensated for the decline in output at Seminole, the largest producing district, and a "wet" gas area.

California, with a production of 829,713,000 gallons in 1930, was again the leading producing State. Oklahoma, with a production of 591,194,000 gallons, was second; and Texas, with 491,299,000 gallons, was third. These three States rank far ahead of the others as regards the output of natural gasoline; in fact, they produced 87 per cent of the total for the country in 1930. The only important change in rank of the producing States in 1930 was the displacement of West Virginia, which ranked fourth in 1929, by Louisiana. This resulted both from an increase in output in Louisiana and from a decline in West Virginia, and reflects principally the increased demand for gas by pipe lines leading from the Monroe and Richland fields of Louisiana. The majority of the less important producing States reported a decrease in output in 1930; the most notable exceptions were New Mexico and Wyoming. In New Mexico the development of large oil and gas fields in the southeast corner of the State led to the gain in output, whereas the output of natural gasoline in Wyoming was considerably augmented through the practice of introducing residue gas into the producing sands at Salt Creek.

The average yield of natural gasoline per thousand cubic feet of gas treated fell from 1.14 gallons in 1929 to 1.06 gallons in 1930. The principal cause of the widespread decline in yields in 1930 was the growth of stabilization, which cut down the volume produced through the elimination of the lighter ends.

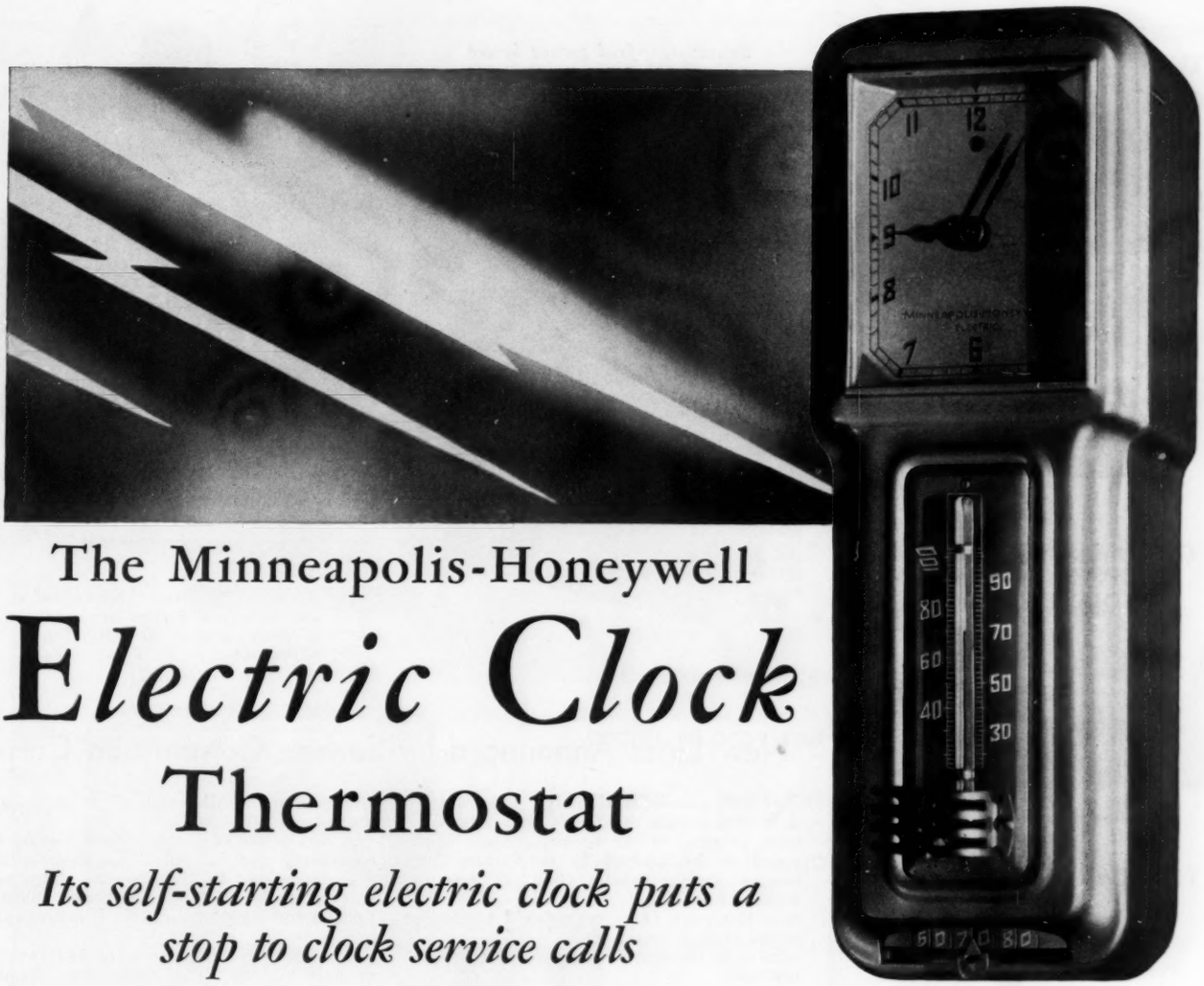
The natural gasoline produced in 1930 had a total value at the plants of $128,160,000, a decline from the previous year of $30,250,000, or 19 per cent. The average value per gallon in 1930 was 5.8 cents as compared with an average of 7.1 cents in 1929.

Lattner Co. Manufactures New H. E. Flueless Boiler

P. M. Lattner Manufacturing Co., Cedar Rapids, Iowa, in November brought from the press a new bulletin, Number 134, describing the Lattner "High Efficiency" flueless boiler. Copies of the bulletin may be obtained by addressing the company at the above address.

The H. E. Flueless boiler is built to the A.S.M.E. code. The arch shaped heat conductors are pressure electric welded to the outside of the shell. The increased amount of heating surface offered by these arches produces the high efficiency of the boiler. The jacket, or outer shell, of the boiler is of double shell construction filled with rock wool insulation.

The new boilers are built in five standard sizes ranging from 1½ to 5 H.P. inclusive. Maximum steam operating pressure is 100 pounds for all boilers.



The Minneapolis-Honeywell

Electric Clock Thermostat

Its self-starting electric clock puts a stop to clock service calls

Here is fuel-saving clock thermostat control of room temperature in its most modern form—all electric. The spring driven, hand wound clock is replaced by the self-starting *electric* clock on the new Minneapolis-Honeywell Electric Clock Thermostat.

No winding. No forgetting. No more service calls to wind clocks.

Plain thermostats or clock thermostats of earlier patterns are easily replaced by this modern all electric thermostat. Gas companies! Here is a new opportunity for extra profit!

Silent, completely silent, automatic change of temperature setting every night and morning is now made possible by the Minneapolis-Honeywell Electric Clock Thermostat. Manufacturers! Here is your opportunity to offer the fuel savings of lower night temperatures by a means that eliminates the last objection to clock control.

Regulated frequency, 60-cycle alternating current, now supplied in most cities, runs this clock's motor which is remarkable for its low R. P. M.

Get full details about this wonderful step forward in thermostatic control for house-heating. Ask the nearest Minneapolis-Honeywell Branch Office or Distributor.

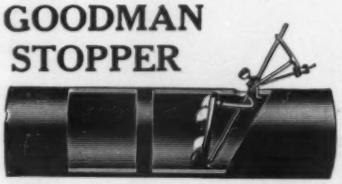
Minneapolis-Honeywell Regulator Co., *California Branch:* 557 Market St., San Francisco, California. *Distributors:* Portland, Seattle, Los Angeles, Salt Lake City, Denver.

DISTRIBUTORS: *North Coast:* Arthur F. Erickson Co., 315 Selling Bldg., Portland, Ore., 816 Terminal Sales Bldg., Seattle, Wash. *Southern California:* English & Lauer, 1224 South Pedro St., Los Angeles, Calif. *Denver:* Daly Co., 1635 Blake St., Denver, Colo., *Salt Lake City:* Hawley-Richardson-Williams Co., 204 Dooly Bldg., Salt Lake City, Utah.

The Minneapolis-Honeywell Electric

Silent, dependable thermostatic control with self-starting electric clock

THE
GOODMAN
STOPPER

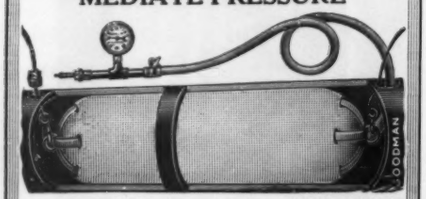


WHEN LOCKED IN PLACE IT HOLDS

DEPENDABLE GAS
MAIN BAGS

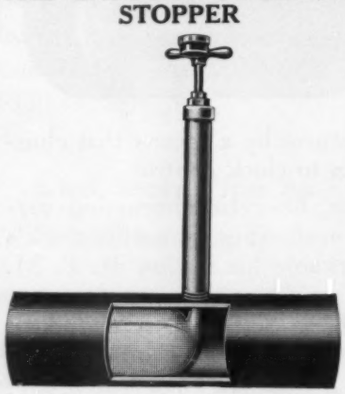
Type C

GOODMAN CYLINDRICAL
STOPPER FOR INTER-
MEDIATE PRESSURE



Increased Length for Increased Pressure

THE GARDNER-GOODMAN
STOPPER



Patented

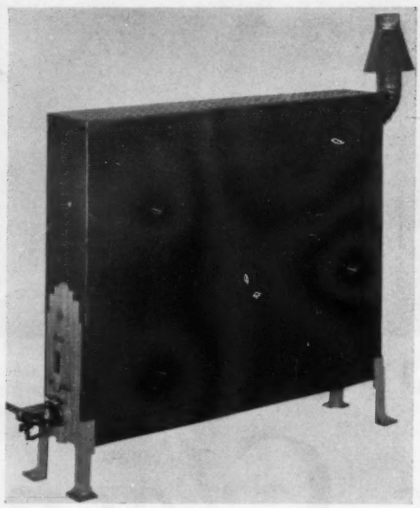
A new stopper for low and intermediate pressures.
For use on cast iron or steel, oversize or undersize mains.
Easily inserted in top, bottom or side of main, in open excavation or under pavements.
For pressure work, use two or more Stoppers in parallel.

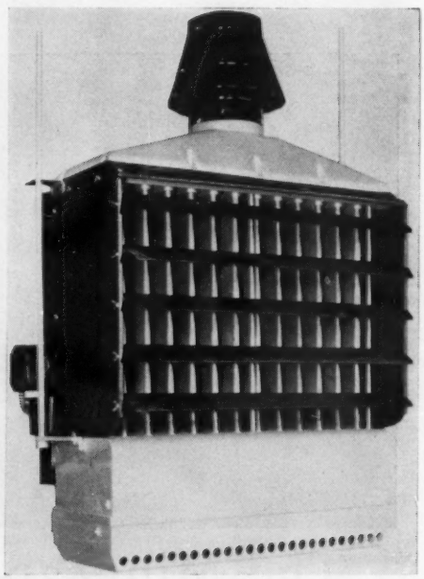
SHIPMENTS FROM STOCK

SAFETY GAS MAIN
STOPPER COMPANY

523 Atlantic Avenue
BROOKLYN, N. Y.
Pac. Coast Rep.: C. B. Babcock Co.
135 Bluxome Street, San Francisco
California

Below: Gas-fired garage heater with 32,000 B. t. u. input per hour. The burners extend the entire length of the chamber. Radiation shields are employed as a protection against fire.

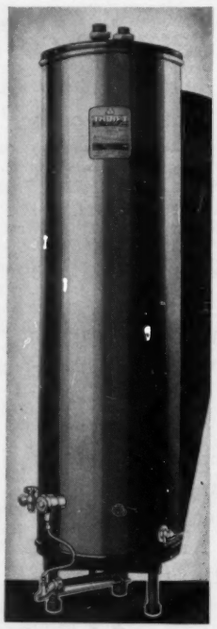




Above: The new commercial and industrial heaters are made in three sizes with 200,000 to 60,000 hourly B. t. u. input capacity.

New Lines Announced by Surface Combustion Corp.

NEW principles of design and construction feature the Thrift Automatic Constant Demand water heater, recently introduced to the industry by the Surface Combustion Corp., Toledo, Ohio. It was exhibited for the first time at the recent A.G.A. convention by the manufacturer.



A seamless steel tube, in direct contact with the water, transfers heat to the water. No air circulates through the heater. The storage heater proper is enclosed in a double insulated shell. The Thrift heater is furnished in two sizes—40- and 60-gallon capacities, with either galvanized or copper tank.

Another appliance introduced by Surface Combustion Corp. is a garage heater. This unit, designed to sell at a moderate price, is made in one size only, with a 32,000 B.t.u. input per hour. Burners extend the entire length of the chamber. Radiation shields are designed to prevent the outer casing from becoming hot.

The heater is modern in design and may be furnished with thermostat control. Burner adjustments are made from the outside of the heater. It is made for operation with either manufactured or natural gas. The unit has an overall length of 40 inches and a height of 37⅛ inches.

A new series of gas fired unit heaters for commercial and industrial buildings has also been introduced by the company. This new unit is made in three sizes with 200,000, 120,000 and 60,000 hourly B.t.u. input capacities.

Many new features are noted in this series of unit heaters. The combustion chamber and header are constructed of cast iron, aluminum finish. Tubes are of Allegheny metal. The fan guard and fan blades are made from Duraluminum. They are designed as separate heating systems and are independent from any other heating equipment installed in the same room. They may be utilized for direct zone heating or connected to ducts for transmitting heat to other sections.

A full set of automatic controls is furnished as standard with all units, and includes spring-type gas pressure regulator, automatic gas pilot, and sail contact mercury bulb switch and electric solenoid gas valve. Thermostats control zone temperatures automatically.

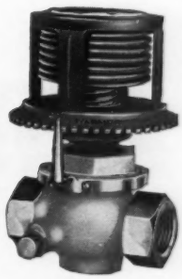
Porum to be Served by Oklahoma Natural in December

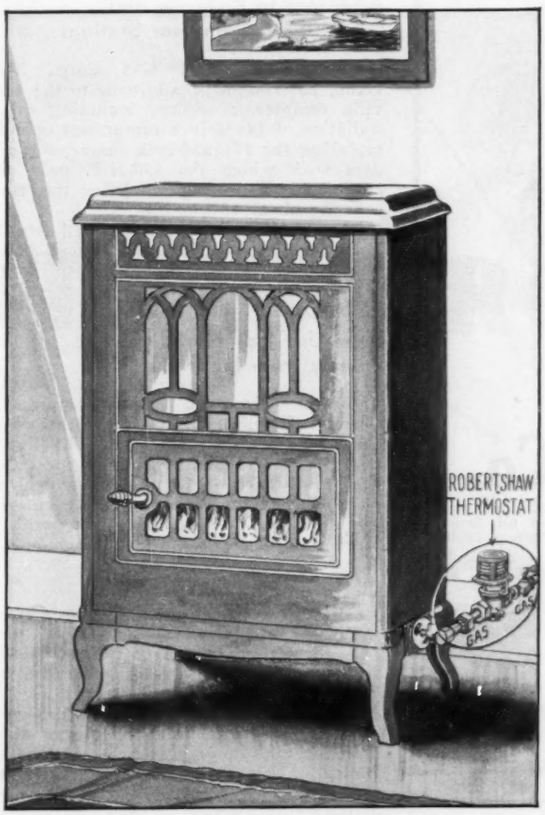
During December, Porum, Okla., will be supplied with natural gas by the Oklahoma Natural Gas Corp., Tulsa., making the 60th city in the state to be supplied with gas by this company. Construction of the distribution system was scheduled to begin late in November, under supervision of C. M. Paterson, head of the engineering department.

New London, Mo. On "Natural"

The Missouri Power and Light Co., Kansas City, Mo., turned natural gas into the mains at New London, Mo., on November 3. Supply comes from the Panhandle Eastern Pipe Line Co.'s major carrier from Texas fields.

Another ROBERTSHAW *Source of Extra Profit*





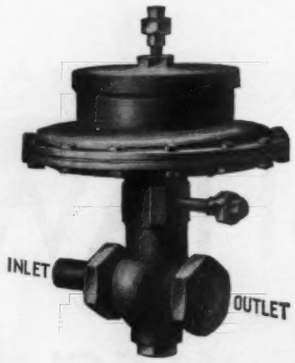
The ROBERTSHAW Space Heater THERMOSTAT

WHEREVER space heaters are used . . . either new or old . . . the Robertshaw Space Heater Thermostat will give you extra profits. It provides the economy of automatic control . . . just as essential in the gas fired space heater as in the gas range or the gas furnace.

The Robertshaw is small, compact, and attractively finished. Simple and durable, it is most easy to install at any time. And it is both automatic and ever dependable.

By adding this No. 2E Robertshaw to the space heater, the owner obtains that even, controlled heat which is such a vital safeguard of health and comfort. Be sure you know the attractive extra profits to be made with this much needed thermostat. Write today for the complete proposition.

ROBERTSHAW THERMOSTAT COMPANY
YOUNGWOOD, PENNA.



Fulton Dead Weight Governor

An unusually sensitive, frictionless and long-lasting governor to be used either as a direct governor, or for individual service. Maintains a uniform pressure throughout the entire range of flow.

WRITE for the Chaplin-Fulton 60-page catalog. It's free and contains data on our many time-tested and proven gas regulators that you will find invaluable in your work.

The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in all Sizes from 1 inch to 24 inches; For all Service, 1 oz. up to 2,000 lbs. Pressure to Square Inch.

28-40 Penn Avenue **Pittsburgh, Pa.**

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We Can Deliver to West and Southwest
Equally as Low in Price as in Middlewest

LUX PURIFYING MATERIAL

MOST ECONOMICAL BECAUSE
MOST EFFICIENT
ALSO LASTS LONGER
QUICK DELIVERY

THE ALPHA-LUX CO., Inc.

192 Front St., New York City. Branches: Philadelphia, Chicago. Storage Base: New Orleans

Central States Electric Co. Completes Line to Greenfield

Central States Electric Co., headquartered at Cedar Rapids, Iowa, announces completion of a gas transmission line from the main line of Continental Construction Corp. to Greenfield, Iowa. The line will also serve Fontanelle and Orient, service scheduled to begin in those two towns early in the spring. An office has been opened in Greenfield by the company, and will be under the managership of C. W. Shafer. F. P. Johnston is district manager. The company has begun merchandising activities at Greenfield. Construction of the main line and distribution system was under the direction of A. J. Lawlor, engineer for the company.

A line is under construction from Continental Construction Corp.'s main line to serve Knoxville, Iowa, also served by Central States Electric Co. Completion is scheduled some time before the first of December, with service expected about that date. The line will serve Pella, Iowa, as well.

Additions to Kellyville and Chickasha Compressor Stations

Oklahoma Natural Gas Corp., Tulsa, Okla., has completed additions to the Kellyville compressor station, including the installation of 18x36-inch compressor cylinders, replacing the 15¼x36-inch compressor cylinders with which the 650-H.P. units were equipped. This will increase the station capacity about 18 per cent.

The company has also installed two 165-H.P. units at the Chickasha station, both of which are equipped with 9x20-inch compressor cylinders.

New Line Completed to Liberty from Smithville Field

A 6-inch line was recently completed for General Utilities Co. by the Brown-Straus Corp. of Kansas City, Mo. The line extends from the Smithville field to Liberty, Mo., a distance of 12 miles, and will augment the present supply which comes from the Avondale district. The line will also serve suburban districts along the route.

Cates and Ewing, Assistant Auditors for Southern Cal. Gas Co.

A. B. Cates, Jr., has been appointed assistant auditor in charge of general accounting for the Southern California Gas Co., Los Angeles. J. Q. Ewing has been appointed assistant auditor in charge of construction and stores accounting for the same company. Mr. Cates will headquarter at the main office, while Mr. Ewing will be located at the Santa Fe Avenue office.

Roy Gearhart, Pipe Line Supt. of Kansas Pipe Line & Gas Co.

Kansas Pipe Line & Gas Co., Salina, Kan., announces the appointment of Roy Gearhart to the position of pipe line superintendent of that company, taking the place left vacant by the transfer of Ray Reagle to the construction department of the company.

Change-Over to Natural Completed at Helena, Mont.

Montana Power Co. of Butte, Mont., completed change-over of its Helena system from manufactured to natural gas early in November. The city has approximately 1,700 meters connected for service.

When a ROBERTS *is once installed*

IT'S IN FOR GOOD!

UTILITY Company Service Men who are familiar with the sound engineering principles of the Roberts Burner, are almost without exception, enthusiastic Roberts boosters. They know from experience that the permanency of any burner installation depends on the ability of that burner to operate up to expectation.

Profit on burner sales depends not alone on making the sale and installation. Profit comes only from burners which stay installed and which are free from the necessity of servicing expense and repairs. That is why managers of many utility companies, when selecting a gas burner to carry their house heating load, are influenced to a large extent, by the Service Man's endorsement of the Roberts Conversion Gas Burner.

Why not add your company to the ever-increasing number of progressive utility companies selling the Roberts? Write for Catalog.

Heat YOUR HOME *with* Gas

ROBERTS-GORDON

APPLIANCE CORPORATION

CURTISS BLDG. BUFFALO, N. Y.

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LATTNER

Industrial Gas BOILERS

An instantaneous success—

The

H. E. FLUELESS

100 lb.

Lattner Boiler

Available in sizes ¾ to 5 H. P. inclusive. Patented construction with thermal efficiency equal to a tubular boiler. A trouble free boiler for process steam generating.

Also tubular boilers from ½ to 30 H.P. Special alloy tubes.

P. M. LATTNER MANUFACTURING CO.

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COMBUSTION EQUIPMENT · LEAHY · LOS ANGELES, CAL. U.S.A.

POWER

POWER is the governor on the machine of production. Regulation and control of power means money to the manufacturer. Leahy Dual Combustion Furnaces, with their fuel flexibility, provide this necessary control. They burn either gas or oil, and one may be substituted for the other without loss of time or efficiency. These gas and oil burners represent the highest development in industrial heating engineering . . . together they provide an assurance of operation that alone is worth the cost of installation.

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LEAHY MANUFACTURING CO
Established 1902
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The CLEVELAND BABY DIGGER

Indicated for Gas Trench

Quality Utility
Efficiency Service

The Cleveland Baby Digger, precision built to the most modern design, meets squarely the demand for a compact, mobile, fast powerful trencher that delivers equal efficiency on long line or city and suburban distribution work. Baby Diggers assure maximum usability, dependability and low cost operation. Their use means most trench in most places at least cost. Write for complete information.

THE CLEVELAND TRENCHER COMPANY

"Pioneers of the Small Trencher"

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Cleveland, Ohio

Distributed by
EDWARD R. BACON CO.
San Francisco, Cal.

Tri-Utilities Reorganization Working Out According to Plans

According to word received from Tri-Utilities Corp., New York, securities are being deposited at a satisfactory rate in accordance with the reorganization plan of the company, the committee having extended the final date of deposit from November 14 to December 17, and has called for deposit the preferred stocks of subsidiary operating companies and the debentures of Peoples Light and Power Corp., as provided for in the reorganization plan dated September 1

The receivership of Southern Natural Gas Corp. is reported by Tri-Utilities Corp. as a friendly one, the former company earning its interest on the first mortgage bonds. Judge Hugh H. Morris of Wilmington, Delaware, and James H. White, president of Southern Natural, were appointed as receivers for the company.

Gas Service at Pecatonica from Rockfort, Ill. Plant

Pecatonica, Ill., is receiving gas service from the Rockford-Freeport high pressure gas transmission line, about 1½ miles from the town. Supply comes from the Central Illinois Electric and Gas Co.'s manufactured gas plant at Rockford, Ill. The line is all-welded and delivers gas to Pecatonica at pressures of from 20 to 50 pounds. A line governor reduces the pressure to about three pounds in the distribution system. Cost of the project was estimated at about $25,000. Frank S. Shugart, service manager, is in charge of the installation of appliances.

George Biddison Named Gas Engineer for Northwestern Natural

George Biddison has accepted a position as gas engineer with Northwestern Natural Gas Co. at Grandview, Wash., taking the place of H. D. Snelson, resigned. Mr. Biddison was formerly with the Wichison Gas & Pipe Line Co., Wichison, Kan. It is reported that the company plans construction of new compressor units at Grandview, and that the work will be under Mr. Biddison's direction.

New District Office Opened at Los Banos by Coast Counties

Coast Counties Gas & Electric Co., Santa Cruz, Calif., opened a new district office at Los Banos during the week of November 16. The new office is equipped with a modern gas heating system, and has floor space set aside for the display of merchandise. The new office is headquarters for the Valley Division of the company, which includes Los Banos, Gustine and Dos Palos, under the managership of H. A. Eldridge.

Postpone Construction of Storm Lake-Cherokee Line

Construction of Iowa Railway and Light Corp.'s gas line from Storm Lake to Cherokee, Iowa, has been postponed until early in 1932, according to word received from J. M. Drabelle, engineer for the company, which headquarters at Cedar Rapids, Iowa.

W. J. Buie Placed in Charge of Stamford Office

Wm. J. Buie has been named to take charge of the Stamford office of the Stamford & Western Gas Co., now a Lone Star Gas Co. subsidiary, replacing J. E. Furneaux, who has been made division manager at Handley. Mr. Buie was formerly sales supervisor of the Stamford office.

Old Friends are True Friends

The holiday season approaches, and again to our many friends in many places we send our heartfelt Christmas greetings.

A decade and a half has passed since Radiantfire was first launched on its mission of bringing cheer and comfort to millions of American homes. Fads and fancies have waxed and waned; other fuels have claimed their brief ascendancies, yet the cheerful glow of Radiantfire has remained undimmed and the gas industry which has made Radiantfire possible still moves onward towards its goal of greater service and wider usefulness.

To the American public, Radiantfire still retains possibly the greatest appeal of any single appliance, and as a steady, reliable builder of load and good will, it remains a staunch and loyal ally of the gas industry which it serves.

The HUMPHREY Radiantfire

General Gas Light Company
Kalamazoo, Michigan

C. B. Babcock, Pacific Coast Manager, 135 Bluxome St., San Francisco

Bakers Make Good Gas Customers—

Bakeries are good gas customers. Your new business department can switch many of them to gas burning ovens. Familiarize your men with McDonald Made Meek Reel Ovens, the most modern and most popular of all gas burning bakers equipment. It is used throughout the country by progressive bakers. Economical, efficient, time-saving and quality baking. Write for new catalog. Use the coupon below.

BRUCE McDONALD COMPANY
Kansas City, Mo.

Also Manufacturers of

RED DEVIL OVENS

(Branch Office in Los Angeles)

BRUCE McDONALD CO.,
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I am interested in switching bakers in my community to gas burning McDonald Made Meek Reel Ovens. Please send me your catalog.

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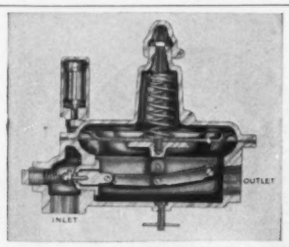

Reynolds Products—

Products for all kinds of Pressure Reduction—for either artifiicial or natural gas.

GOVERNORS—Intermediate Pressure, Triple Outlet, Holder, Toggle Type Street.

REGULATORS—High Pressure Service, Low Pressure Service, High Pressure Line, Single and Double District Station.

VALVE—Automatic, Quick-Closing Anti-Vacuum, Relief, Cut-off.

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GAS CONTROL SINCE 1892

Reynolds Gas Regulator Co.
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422 Dwight Building—Kansas City, Missouri
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FORNEY

COMBINATION GAS and OIL BURNERS

For Power Plant and Industrial Uses

Write for Literature and List of Installations

FORNEY COMBUSTION ENGINEERING CO.
513 CENTRAL BANK BUILDING, DALLAS, TEXAS

New Rate Schedules for Several Oklahoma Cities and Towns

Subsidiaries of the Cities Service Co. in Oklahoma have announced a voluntary reduction of gas rates in 14 cities and towns in northeastern Oklahoma, effective with December bills, as follows: Consumers Gas Co., serving Bluejacket, Cardin, Commerce, Douthat, Miami, North Miami, Picher, and Welch; Union Public Service Co., serving Beggs, Chelsea, Delaware, Dewey, and Nowata, and the Bartlesville Gas & Electric Co., serving Bartlesville. The new domestic rate is $1.00 for the first 1,000 cu. ft. and 45 cents per 1000 for the next step.

The corporation commission has also approved voluntary reductions of domestic and industrial gas rates by the Oklahoma Utilities Co. applying to Bristow, the State Fuel Supply Co. applying to Avant and the Muskogee Natural Gas Co. in and adjacent to Muskogee. The new domestic rate at Bristow is 50 cents per M for the first 10,000 cu. ft., for schools, and at Muskogee, 45 cents per M for all gas used.

Gallatin Natural Gas Co. Completes Additional Line

Gallatin Natural Gas Co., Billings, Mont., the transporting company associated with the Billings Gas Co., recently completed a gas transmission line from the Wyoming-Montana state line extending in a northerly direction 11 miles. It was built of 8-inch plain end beveled line pipe, solid welded. The new carrier parallels the original Elk Basin-Billings gas line throughout its entire length, providing a double line for that distance from the field. It was constructed because of the need for greater pipe line capacity. The original Elk Basin-Billings line is 67 miles in length, carrying gas from the Elk Basin field to Billings and seven other towns in Montana which are served by the Billings Gas Co.

Council Bluffs Annual Cake-Baking Contest Held Nov. 25

Council Bluffs Gas Co., Council Bluffs, Iowa, held its third annual cake baking contest on November 25 at Hotel Chieftain. The cakes baked for the contest were given to charitable institutions in the city for their Thanksgiving dinners. Twenty-five major prizes were given, including a gas range, a conversion burner, storage hot water system and space heaters.

Pecan Grove, Okla. to Have Service from Holdenville

A gas transmission line is to be run from the city of Holdenville, Okla., to serve residents of Pecan Grove. The line will also furnish gas to residents along the highway. Central States Light & Power Co. serves Holdenville.

Home Gas Co. Now Serving "Natural" at Council Grove

Council Grove, Kan., is being piped for natural gas service by the Home Gas Co., Inc., of Council Grove. Supply for the town comes from a local field about seven miles west of the town.

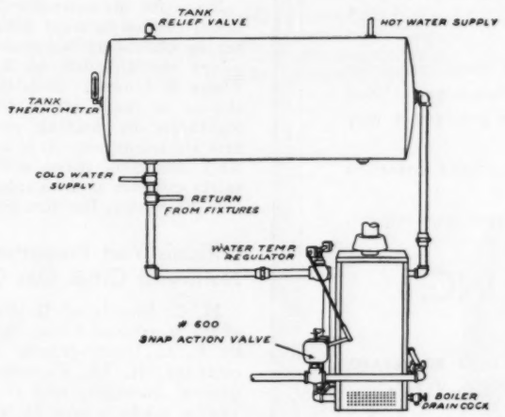
New Gas Distributing Co.

The St. Cloud Oil and Gas Co. has been formed at Malta, Mont., to engage in the business of producing and distributing natural gas. Directors of the company are Erick Larson and F. W. Kroeger of Saco and M. Clayburg of Scobey.

DIRECT HOT WATER SUPPLY

using Type GA (Water)

IDEAL GAS BOILER



COMPLETE EQUIPMENT INCLUDES

- Snap-Action Valve with Thermostat Pilot
- Special Arco Regulator (160° Max.)
- Regulator fitting
- Gas Pressure Governor
- Boiler Drain and Pilot Cocks
- Tank Relief Valve
- Tank Thermometer
- Insulated Enameled Jacket
- Vitreous Enameled Draft Diverter

Everything Complete Except the TANK

Complete equipment with everything included but the tank, the **direct** hot water supply system using the Type GA (Water) Ideal Gas Boiler combines both efficiency and low cost. It is a compact unit—without intricate piping—designed and tested to assure maximum service and safety. All controls necessary for maintaining uniform water temperature are included in the equipment.

All sections of Type GA Ideal Gas Boilers receive a hydrostatic pressure test of 200 pounds per square inch at the factory. Then, the assembled boiler is subjected to the same test. This gives an allowable working pressure of 80 pounds—assuring greater safety. The boiler sections are shipped completely assembled.

Attention is called to the location of the special Arco Regulator (160° max.) in the return line as shown in the diagram above. In this position the rapid response of the regulator to slight changes in tank temperature insures the maintenance of a most uniform temperature of the water in the tank.

Write today for surprisingly low cost of this complete direct hot water supply system.

AMERICAN GAS PRODUCTS CORPORATION

Chrysler Building, New York City

Division of AMERICAN RADIATOR COMPANY

"Consider these features of the ALCO magnetic gas valve."

Quiet—Inexpensive—Will not leak—Packless—Power consumption only 12 watts—Furnished for high or low voltage A. C. or D. C.—Sizes ½"-1½" inclusive.

These are the features that make the Type SG Valve an ideal control for domestic gas burners using either natural or manufactured gas. Used in connection with any standard thermostat, this valve provides a very satisfactory though inexpensive control.

The Type SG Valve can be furnished with an emergency hand operation feature and a pilot light fitting if desired.

Detailed information is contained in our Bulletin No. 112 sent upon request.

ALCO VALVE COMPANY, INC.

ALCO

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FOR ALL REQUIREMENTS
NEMEC combustion ENGINEERS
WHITTIER – CALIFORNIA.

TAPPAN
Supremacy

is not a newly-won achievement, but an old and accepted standing in the eyes of gas appliance men and the public alike. No other gas range combines so many outstanding superiorities into such a perfect whole—the TAPPAN Insulated Oven gas range.

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665 Howard St.
San Francisco

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2512 N. Stevens
Tacoma

Dallas Gas Co. Entertains Architects and Engineers

The Dallas Gas Co. was host to 50 Dallas architects and engineers at a luncheon in the Dallas Gas Building recently. Talks were made by Henry C. Morris, president of the Dallas Gas Co., Otto H. Lang, of Lang and Witchell, and Ed Connor, representing the company, as engineers of the building, and Will C. Grant, who presided. Following the luncheon, an inspection of the building was conducted by L. G. Waskom and L. A. Bickel of the Dallas Gas Co.

Educational Safety First Campaign by Oklahoma Natural Gas Corp.

Plans for an extensive Safety First educational campaign were formulated in November by Oklahoma Natural Gas Corp., Tulsa, under the direction of R. S. Huffman and Elmer Kohlhorst. It is the aim of those in charge to reach all of Oklahoma Natural's employees by holding meetings, organizing first aid teams, etc. It is anticipated that possibly two girls' teams will be entered in the safety contests at the exposition of the American Petroleum Institute in the spring.

Officials Visit Properties of Northwest Cities Gas Co.

H. C. Morris of Dallas, Texas, president of the Northwest Cities Gas Co., accompanied by L. L. Dyer, general comptroller of the company, H. M. Thomas, of Walla Walla, general manager, and O. B. Custer, Walla Walla, made a tour of the Northwest Cities Gas Co. properties in Oregon, Washington and Idaho in November. The company headquarters at Walla Walla, Wash., and is a subsidiary of Lone Star Gas Co., Dallas, Texas.

Rich Hill and Hume, Mo., to Be Served from Local Source

The work of piping Rich Hill and Hume, Mo., for natural gas service is nearly complete, with service expected to begin by around Thanksgiving time. Supply for the towns comes from wells near Hume, a few miles from Rich Hill. The main line from Hume is just about completed. Bourdon Pipe Line Co. is constructing the line.

Miss Davidson Resigns; Mrs. Roberts to Head Arizona Womens Committee

Miss Una Davidson of the Arizona Edison Co., Phoenix, chairman of the Women's Committee of the Arizona Utilities Association, has resigned that post and is succeeded by Mrs. Jean Roberts, home service director of the Tucson Gas, Electric Light & Power Co., Tucson, Ariz.

Canadian Western Declares Extra Dividend in October

Canadian Western Natural Gas Light, Heat & Power Co., Ltd., Calgary, Alberta, in October declared the regular quarterly dividend of $1 per share and in addition an extra dividend of 50 cents per share, both payable to stockholders of record on October 15.

Northern States Power Co. Asks Franchise Renewal

Northern States Power Co., Minneapolis, Minn., is applying for a renewal of its gas franchise at St. Paul, Minn. The tentative gas franchise under consideration by the city council includes a clause which would permit the use of natural gas should this prove expedient.

Decorative Cover

Liberally ventilated to insure free circulation of air at actual room temperature. Attractive lines. Easy to keep clean.

Heavy Valve Casing

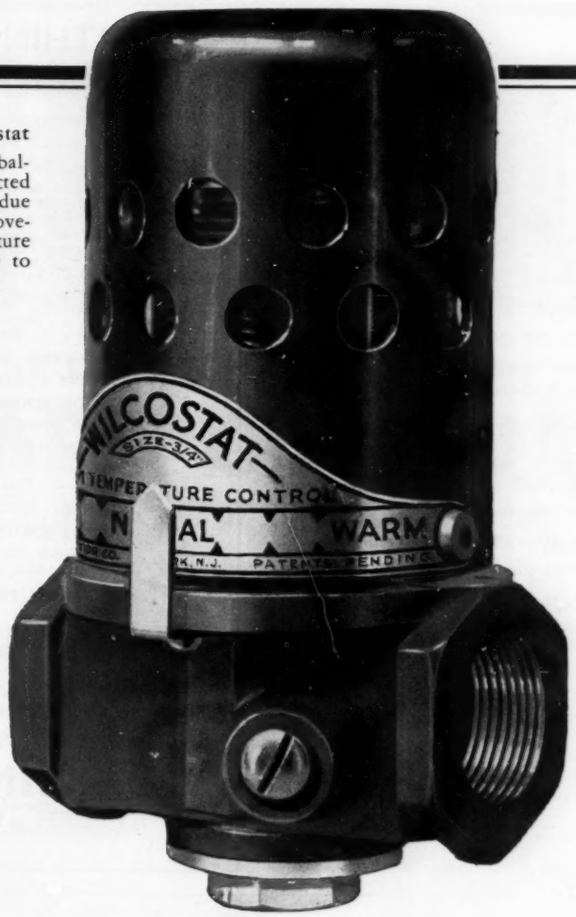
Accurately machined. High pressure type valve rod. Serves as base for assembly of complete Wilcostat. Incorporated by-pass adjustment and pilot light-outlet.

Sensitive Bellows Thermostat

Complete assembly unit of balanced construction. Protected against abuse or straining due to over-expansion. Large movement per degree of temperature change. Responds instantly to change in temperature.

Self Aligning Valve Construction

Easily removed for cleaning, if necessary. Large capacity with extremely low pressure drop.



To the GAS COMPANY Not Selling Enough Space Heaters—

THE merchandise manager whose sales of space heaters need stimulating may have overlooked this important fact—

Nowadays people demand more than just *heat* from a heater. They require *ease* and *certainty* of operation.

They get it in Wilcostat Automatic Room Temperature Control. It unfailingly keeps the temperature within a degree of the setting. Is adjusted by an easy turn of the wrist. Is attractive, but ruggedly constructed.

Play up the Wilcostat in your showrooms. You'll sell more heaters when folks realize how convenient they are with a Wilcostat to guide them.

This isn't just talk. One aggressive gas company has just sold nearly 500 Wilcostats in a few weeks. Many other companies are actively using the Wilcostat to promote new heater sales, and for modernizing older installations.

At a nice profit, too. Write for prices and literature.

THE WILCOLATOR COMPANY, Newark, N. J.

Specialists in Temperature Control for Household Appliances

READERS of WESTERN GAS

MAKE USE OF OUR OFFICES as headquarters during your visit to the Olympic Games.

YOUR MAIL may be forwarded in our care.

USE OUR FREE stenographic and telephone service.

HOTEL RESERVATIONS and sight seeing trips planned for you.

MEET YOUR friends here.

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Stop at San Francisco on your trip to or from the Olympic Games. The same facilities are offered you at the San Francisco office of WESTERN GAS—447 Sutter Street—San Francisco

WE'LL BE GLAD TO SEE YOU.

WORTHINGTON PRODUCTS

COMPRESSORS
Portable . . . Stationary

ROCK DRILLING EQUIPMENT
Rock Hammers and Drifters
Contractors Air Tools
Drill Steel and Accessories
Automatic Heat Treating Machines
Forging Furnaces

MULTI-V-DRIVES

PUMPS
Centrifugal . . . Steam . . . Power
Rotary . . . Deep Well

FEEDWATER HEATERS
Locomotive . . . Stationary

CONDENSERS
and Auxiliaries

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Water . . . Grease
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DIESEL ENGINES

GAS ENGINES
Power and
Compressor Units

CHROMIUM PLATING

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GAS BURNERS
For
ALL INDUSTRIAL PURPOSES

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Oklahoma Natural Gas Bldg.
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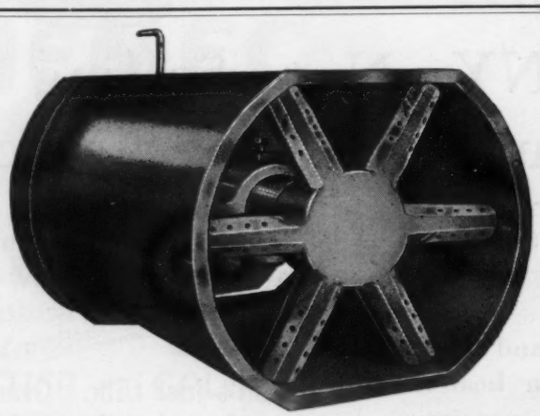
Flameless Burners
Flame Burners
Short Flame Burners



REFRACTORIES

For Gas Appliances

Genceraco Refractories are made in all shapes and sizes, in color, decorated or plain and in any quantity. They may be had in dense as well as porous material. These refractories are extremely resistant to thermal shock and are physically strong. We will gladly send you a quotation on your requirements for space heater radiants, leaning baffles, back walls, tunnel radiants, radiant sticks, burner tips, or any special pieces.

GENERAL CERAMICS COMPANY
71 West 35th Street, New York, N. Y.

Several Personnel Changes Announced by Lone Star

Personnel changes announced recently by the Stores Department, Lone Star Gas Co., are as follows: A. R. Sissoms, transferred from Texas Cities Gas Co., Paris, to Community Natural Gas Co., Bonham, Texas; F. H. Smith, Community Natural Gas Co., Bonham, transferred to Mexia; D. G. Curd, Community Natural Gas Co., transferred from Temple to Abilene, Texas; Otis Clark, Community Natural Gas Co., transferred from Vernon, Texas, to Frederick, Okla. H. E. Eubanks will take Mr. Sissoms' place in Paris, and G. F. Peck will be storekeeper at Temple, replacing D. G. Curd. G. P. Williams replaced Otis Clark as storekeeper at Vernon.

North Central to Extend Service to Gurley, Dalton and Sidney, Neb.

North Central Gas Co., Casper, Wyo., has applied for natural gas franchises in Gurley and Dalton, Neb., and is said to be considering filing a similar application at Sidney, Neb., supply for the three towns to come from the reconditioned oil carrier leased by the company from Standard Oil Co. of Indiana. It is understood that the company plans to extend a lateral south through Gurley and Dalton to Sidney, although formal announcement to that effect has not been made. The company is now extending service to Ogallala.

Special Jumbo Edition of Electrolux Refrigerator News

Electrolux Refrigerator News came out in a special Jumbo Edition in October, the number being dedicated to the gas industry. It is made up in newspaper style and features statements relative to gas refrigeration made by such men as C. E. Paige, past president of the American Gas Association, A. J. Peters, general sales manager of the Consolidated Gas Co. of New York, and others.

An interesting chart is included, showing the growth of Electrolux household unit sales from less than 50,000 in 1924 to 770,000 in 1930.

Sugar City About to Have Gas from Colorado Interstate Line

Progress is noted on the construction of the line to take gas from Rocky Ford to Sugar City, and Ordway, Colo. The line will also extend to Manzanola and Fowler. Supply for the new line comes from the Colorado-Interstate Gas Co.'s major carrier to Denver, and gas will be served in the new towns by Arkansas Valley Natural Gas Co.

Appliance Survey by Natural Gas Corp. at El Centro, Calif.

Natural Gas Corp. of California is conducting an appliance survey in El Centro, Calif., to ascertain what adjustments will be necessary in changing over from oil gas to butane-air service. R. L. Hayden is manager for the company at El Centro and is in charge of the survey.

To Serve Dickinson, Texas

The Houston Pipe Line Co., Houston, Texas, is running an extension from the Texas City-Galveston line of the company to serve Dickinson, Texas.

Franchise to Kansas Pipe Line & Gas Co.

Bushton, Kan., has granted a franchise to Kansas Pipe Line & Gas Co., of Salina, Kan.

AND NOW, PAYNE OFFERS THE

NEW STANDARD CONSOLE

A Real Heat Circulator . . . Built to Sell at a Popular Price!

FRONT LOUVRE MODEL

TOP GRILLE MODEL

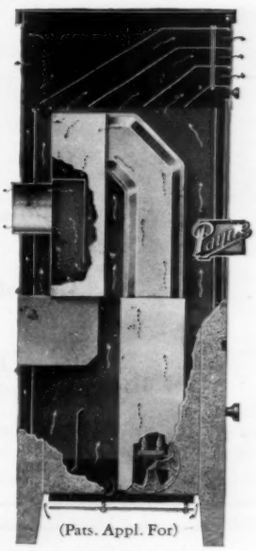
Here it is—a *Full Vented Warm Air Heat Circulator . . .* for homes, offices, stores and auditoriums. Front louvre and Top Grille Models in three sizes from 15,000 to 30,000 B. T. U. capacity. Answers every modern heating need of the conscientious dealer. Instant appeal to owners and renters. New Features. New price ranges. Investigate immediately.

FEATURES:

- Burner is reversible for right or left hand connections.
- Completely welded gas-tight and air sealed heating element.
- Built-in Vent Manifold and Down-Draft Diverter for short vent connection.
- Insulated outer casing keeps top and side cool.
- Heater stands close to wall, improving appearance—sets closer to floor, eliminating floor drafts.
- When warm air louvres are closed gas cannot be turned on.
- When open, louvres direct heat into upper areas of room providing complete circulation and warm air distribution.
- May be equipped with Automatic Room Temperature Regulator.
- Thermostatically controlled burner eliminates necessity of a pilot.
- No open flames or exposed valves..absolutely safe for women and children.
- Antique walnut crinkle finish—extremely attractive and durable.

Also—For stores, banks, churches, clubs, cafes, schools and factories, a New *Top Grille* Model with one-piece square lattice cast grille finished in statuary bronze!

Write for Literature



Cross-section of New Standard Payne Console Heater showing air travel around heating element and elimination of gases through vent.

Payne

PAYNE FURNACE & SUPPLY CO.

BEVERLY HILLS, CALIFORNIA

There is a Payne Heat System for Every Building and Climate.

COMPLIES WITH NATIONAL SAFETY REQUIREMENTS · AMERICAN GAS ASSOCIATION · APPROVED ·

LOW COST
Gas Heating With The Johnson Junior

Johnson Junior now brings gas home heating within the means of everyone. Dependability and efficiency have been built into this marvelous low cost unit. Johnson Junior may be purchased complete—stripped or with any control system, or accessories desired. This flexibility makes possible the sale of Johnson Junior in homes where a partially automatic system has already been installed—or where manual operation is desired. Write now for full information.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Representative—C. B. BABCOCK CO.
135 Bluxome St., San Francisco, Calif.

Newman Gas Equipment Co.

Industrial and Commercial Burners

Upshot Burners for Ideal Boilers

Bailey Regulators for Gas Fuel and Pressure Regulation

447 Sutter Street San Francisco Ph. GA 7833

RAY VITALITE GLO

Radiant Gas Heaters

Send me details about the quick, easy installation feature, and "fixed mix."

Name .....

Company .....

Address .....

Clip and Mail to Ray-Glo Corporation, Athens, Ohio.

Refinery Supply Co. Offers Catalog on Specialty Lines

The Refinery Supply Co., Tulsa, Okla., recently brought from the press Catalog No. 20, describing the various lines of Ac-Me and Refinery Supply specialties for natural and manufactured gas. The Ac-Me line includes the recording gravitometer, specific gravity gas balance, pressure vacuum pump, 100-inch watercolumn, loading dome cover, look box. The refinery supply line includes the fractionating column, portable vacuum pump, mercury cleaner, manometers, dead weight tester, orifice well tester, alligator oil thief, and gas leak detector. Copies of the bulletin may be obtained by writing the company at the above address.

Kansas Pipe Line & Gas Co. Plans Nine New Systems

Kansas Pipe Line & Gas Co., Salina, Kan., plans to distribute gas in several towns along the route of the Northern Natural's 26-inch carrier from Mullinville to Clifton, Kan. Among the towns in which Kansas Pipe Line will build systems are the following: Belpre, Claflin, Beverly, Bushton, Delphos, Holyrood, Macksville, Miltonvale and Seward. Franchise applications are pending or have been granted in most of these towns, and preliminary surveys have been run.

Pacific Pipe & Supply Brings Two Bulletins From the Press

Pacific Pipe & Supply Co., Los Angeles, in November brought from the press Bulletin No. 4, a new publication on the Perfection Duplex Trap, and Bulletin O-4 on Papico Natural Gas Odorizing System explaining the city gate odorizer. In addition to the above products the company manufactures orifice disc fittings, calibrated meter runs, multi-tube straightening vanes, and indirect water heaters.

Montana Power's Manufactured Gas Plant Shut Down

The manufactured gas plant at Butte, Mont., was shut down on November 7, following 41 years of service, being constructed in 1890. Montana Power Co. purchased the system many years ago and operated it until the completion of the 225-mile natural gas transmission line from Cut Bank field to Butte. The old plant will be scrapped.

Gain in Net Profits Announced by Pacific Public Service

Pacific Public Service Corp. reports that consolidated net profits for the September quarter were $315,076.23. These profits exceed by $48,402 the net earnings for the first half of the year, and represent a gain of $124,361, or 65 per cent over profits for the preceding quarter.

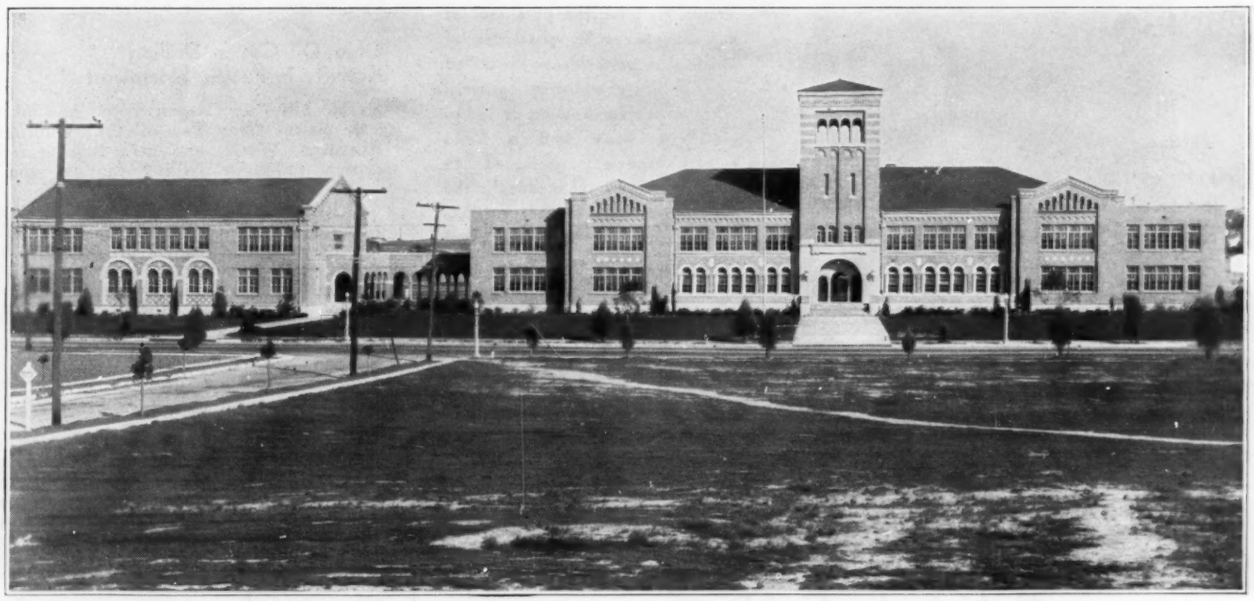
New Offices for United Gas Public Service Co. at Jennings

The United Gas Public Service Co., headquartered at Houston, Texas, recently opened new offices in Jennings, La. J. L. Blackwell is sales manager, W. D. Ellington is service manager and Miss Mabel Greidenwise is office manager.

Seventh Annual Conference on Welding at Purdue University

The Seventh Annual Conference on Welding will be held at Purdue University, Lafayette, Ind., on December 10 and 11, 1931. The conference is under the direction of the Engineering Extension Department of the University.

ANOTHER NEW SCHOOL HEATED BY CLOW GASTEAM—ANOTHER PROOF OF THIS HEATING SYSTEM'S WIDE ACCEPTANCE



El Segundo High School, El Segundo, Calif.
Architects: Alfred W. Rea, A. I. A., and Chas. E. Garstang, Los Angeles, Calif.
In addition to the above, Clow Gasteam Radiators are installed in the Manual Arts and Gymnasium Buildings, erected at a later date and not shown in this photograph.

Because Clow Gasteam not only provides a more convenient heating system, but an economical one as well, it has proved highly successful for school heating.

More than 700 schools are heated by Clow Gasteam in Southern California alone.

Operation is simple—and dependable. There is no complicated piping system—installation and servicing costs are extremely low.

And, because each radiator is a complete heating unit, there need be no heat waste. The total season's heating cost, given here, illustrates the economy of Clow Gasteam.

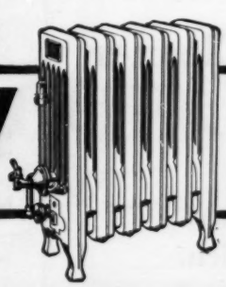
HEATING DATA

Clow Gasteam Radiators Installed	67
Total Square Feet of Radiation	4948
List Price of Radiators	$5722.00
Operating Cost with Natural Gas—Season 1929-30—927,900 Cu. Ft.	$696.10

Included in the above operating cost is gas consumed in forced warm air furnace heating systems for auditorium of Administration Building and Gymnasium —also water heater for Gymnasium.

JAMES B. CLOW & SONS 201-299 N. Talman Avenue, Chicago

CLOW GASTEAM



Listed by Underwriters Laboratories

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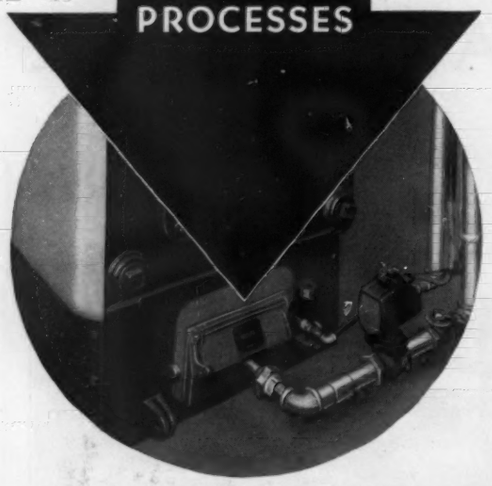
THERE IS A CECO GAS BURNER
for HOME, BUSINESS BLDG., POWER PLANT, REFINERY and INDUSTRIAL PROCESSES



Gas companies who recommend CECO Gas Burners to their patrons are sure of customer satisfaction . . . for the purchaser of a Ceco has as his guarantee of satisfactory performance the skilled service of combustion experts. Whether it's for heating or industrial use, you'll find a Ceco Burner especially designed to give the most economical, the most dependable operation. Illustrated Bulletins will be sent promptly on request.

COMBUSTION EQUIPMENT COMPANY
GENERAL OFFICE: KANSAS CITY, MO.
WICHITA MEMPHIS LITTLE ROCK HOUSTON

BITGOOD
Multiple Jet Gas Burners
Industrial Furnaces
SAN JOAQUIN BURNERS
Prat Daniel Thermix Stacks and Air Heaters
Bigelow-Liptak Suspended Arches and Walls
North American Burners and Blowers
F. S. BITGOOD, Inc.
Furnace and Combustion Engineers
Los Angeles Portland San Francisco

Gentlemen:
Kindly send me a sample
can and full details regarding
A-B Vit
The New Porcelain Enamel Cleaner
Name.....
Company.....
Address.....
No obligation, of course
Clip and Mail with 10c to cover postage and packing to
A-B STOVE CO., Battle Creek, Mich.

Indianapolis May Soon Have "Natural" Service

Citizens Gas Co. of Indianapolis, Ind., reports that nothing definite has been done toward bringing natural gas to that city, although two companies have signified their readiness to bring the fuel to the city gate.

Ohio Fuel Gas Co., subsidiary of the Columbia Gas & Electric Co., has practically completed a 12-inch line from Muncie, Ind., to a point near Rockport, on the Indiana-Illinois State line. This line connects with the Panhandle Eastern Pipe Line Co.'s carrier from the Panhandle of Texas. That company has indicated that it will submit a bid any time the Citizens Gas Co., now serving manufactured, is ready for it.

Kentucky Natural Gas Co., bringing a line north from Kentucky fields, has also signified its desire to submit a proposal to the Indianapolis franchise holder.

Ohio Oil Co. in Drilling Activity in Pacific Northwest

Ohio Oil Co., Casper, Wyo., has taken a lease on the Gray Tac Oil Co.'s holdings in Aberdeen, Wash., and according to report, expects to begin drilling for gas and oil early in the year.

Drilling in the Weiser-Payette district of Idaho is also being carried on by Ohio Oil Co. under the direction of Ben Hollingsworth, superintendent. The company is reported to have made applications for the service of natural gas in towns between Boise and Weiser, Ida.

Jackson, Minn., Voting on Peoples Natural Gas Co. Permit

Jackson, Minn., was scheduled to hold a franchise election late in November. Peoples Natural Gas Co., Omaha, Neb., is the applicant. Supply would come from the line now being constructed by the Missouri Valley Pipe Line Co. from Mason City, Iowa, to Owatonna, Minn.

Walker Appointed to Post As Oil and Gas Investigator

S. O. Walker of Visalia has been appointed to the position of special investigator in the Southern California district office of the State oil and gas supervisor, R. D. Bush. Mr. Walker's appointment became effective November 1.

Prove 30,000 Acres of North Dakota Land for Gas

According to reports credited to D. J. Carter, vice-president of the Northwestern Oil & Natural Gas Co., Baker, Mont., six gas wells have been placed on production recently, proving more than 30,000 acres for gas in Bowman County, North Dakota.

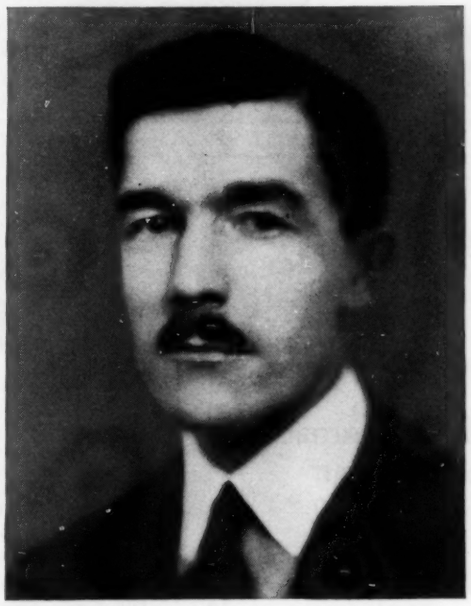
Red Cloud, Neb., Served from Reconditioned Oil Carrier

Natural Gas Distributing Co., Lincoln, Neb., began service in Red Cloud, Neb. during November. Supply comes from the Kansas and Texas fields through a portion of the Stanolind oil carrier, leased by Kansas Pipe Line & Gas Co., Salina, Kan. Blue Hill will also have service from this line.

New Home Service Director

Miss Elizabeth Leach has been appointed as home service director for Oklahoma Natural Gas Corp., Tulsa, Okla.

"ELECTROLUX takes the small convenience user out of the non-profit class"



This is the statement of A. J. Gonnoud, president of the Kings County Lighting Co. of Brooklyn, N. Y.

IT SEEMS like A B C to gas executives like A. J. Gonnoud that it's smart to merchandise and sell Electrolux with everything they've got.

Because they *know* that every Electrolux they sell adds 1500 cu. ft. to the monthly load—and 1500 cu. ft. added to the usual small convenience load is just what's needed to take these convenience users out of the non-profit class. And permanently!

More than that, because Electrolux is so *modern*, it does a job for you in publicizing the up-to-dateness of gas. This means a new prestige for the gas company, a strong impetus to the sale of other gas appliances.

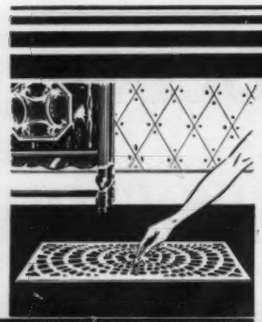
We've prepared a series of merchandising and sales pieces to help you start, follow up and close profitable Electrolux sales in your territory. And if these don't fill your bill, we'll see that you get exactly what you need. So write us today. Plan now to be on the band wagon to increased MCF's with Electrolux—in 1932! Electrolux Refrigerator Sales, Inc., Evansville, Ind.

ELECTROLUX

THE *Gas* REFRIGERATOR

A tiny gas flame takes the place of all moving parts

Turn on THE HEAT!



Electrogas
PRODUCES
A NEW MODEL
NUMBER 51
51,000 B.T.U. A.G.A. Approved
"It's Matchless"
ELECTROGAS FURNACE CO.
466 SUTTER STREET • SAN FRANCISCO

Announcing
The New
No. 110
Fraser Floor Furnace
20,000 B.t.u. INPUT
LIST PRICE $45.00

Approved by
A. G. A. Testing Laboratory

Write for Specifications and Further Information

Manufactured by
Fraser Furnace Company
Stockton, Calif.

Distributed by
H. R. BASFORD CO. San Francisco Los Angeles

...It's mutual

Because of our splendid gas supply here on the Coast, the demand for Madsen gas-fired hotel and restaurant equipment is constantly growing.

And, because Madsen ranges, broilers and other kitchen equipment are properly designed for the most efficient and economical consumption of gas, new friends are made every day for this favorite fuel.

So, our interests are mutual, and Madsen believes in co-operation. Try us.

MADSEN
IRON WORKS, Ltd.
P. O. Box 601, Huntington Park, Calif.
(Suburb of Los Angeles)
San Francisco Factory Representative:
Fred R. Sanford, 631 Second Street

WILLIAMS
GAS STEAM RADIATOR
Made in 22 sizes from 26 to 180 feet of rating.
IMMEDIATE HEAT AUTOMATIC LIGHTER
Improved Combustion. Positive Gas Control.
Write for descriptive matter and prices.
WILLIAMS RADIATOR COMPANY
1865-1873 Cordova St. Los Angeles, Calif.

Shop Department Employees of Texas Cities Gas Co. Now Uniformed

Meter readers and fitters of the Shop Department of Texas Cities Gas Co., El Paso, Texas, have been fitted out with uniforms recently for the purpose of identification. Officials of the company came to the conclusion that cards were insufficient, following the daylight holdup of a housewife by a man posing as a meter reader.

Over the left shirt pocket of the new uniform is the name of the company, and over the right pocket is the name of the employee.

Groble Gas Regulator Co. Announces New Catalogue

The new house service Regulator Catalogue No. 5 of Groble Gas Regulator Co. is just off the press. The brochure contains information on the company's line of service regulators for both high and low inlet pressure. A copy will be mailed on request to the company.

Borger, Texas, Plans Municipal Gas Distributing System

The municipality of Borger, Texas, plans to install a city-owned gas distribution system, and is reported to have contracted with the Huber Petroleum Co. for a supply of gas. Panhandle Power & Light Co. at present distributes gas in the town.

Change-Over at Lafayette, La. Completed on November 10

Louisiana Public Utilities Co., Inc., on November 10 completed changeover from manufactured to natural gas service at Lafayette, La. The town is served from the lines of the United Gas Public Service Co., Houston, Texas.

Newton Voting on Municipal Gas Distribution System

Newton, Kan., was scheduled to hold an election late in November to decide on a bond issue to construct a municipal gas distributing system. The bonds would amount to about $300,000. The Newton Gas Co., subsidiary of Gas Service Co. is now serving the town.

Valley, Neb., Served; W. R. Rogers Named Local Manager

Valley, Neb. received gas early in November from the mains of the Northern Natural Gas Co. of Omaha. W. R. Rogers has been named local manager for the company at Valley, coming from the Louisville, Neb. office of the company.

Plan Municipal Gas Plant

Burns and McDonnell and Emporia Engineering Co. have been employed by the City of Eldorado, Kan., for the purpose of ascertaining the advisability of installing a municipal natural gas distribution system there.

Beggs Grants Franchise to David M. Logan on Nov. 10

Beggs, Okla., on November 10 granted a gas franchise to David M. Logan of Okmulgee. Mr. Logan agrees to establish gas service by January 1, 1932. The town is also served by the Union Public Service Co.

Miniature reproduction of a newspaper page showing how dealers tie in with P. G. and E. advertising

BUYERS *are looking for* DEALERS

Tie-in ads turn buyers to your store

Dealers who tie in their advertising with that of Pacific Gas and Electric Company are receiving a constantly increasing number of prospects and sales.

Records show that dealers who do not use tie-in advertising complain about the lack of prospects.

The reason is obvious, for this Company's advertising is designed primarily to create public acceptance of all gas appliances of good quality. In addition, each advertisement suggests that prospects visit their dealers' stores. Following this suggestion, prospects naturally look for dealers. If you advertise in space adjoining each P. G. and E. advertisement, prospects turn to you.

Should you desire to increase your sales, as others are doing, it will be worth your while to try tie-in advertising this month. Your local newspaper will gladly give you the publication dates of our advertisements.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

206-1231 WG

VITEX

The Perfect Gas Vent and Flue Pipe

NOW

Officially approved
by the
National Underwriters
Laboratories
in their report

Dated Oct. 12-31 M H No. 2252

WRITE
for fully
descriptive
catalog to

PLANT RUBBER and ASBESTOS WORKS

537 BRANNAN STREET....SAN FRANCISCO

Manufacturers

Dallas Gas Building is Social Center for Civic Organizations

A center for civic organization meetings has recently been established in the Dallas Gas Building, Dallas, Texas, with Albertine Berry, home service director in charge. The company offers the public the use of an entire floor, including large auditorium with stage, a ladies' lounge, a kitchen, and a game room for small parties.

The plan has already proved popular for civic and social meetings and more than 600 people took advantage of the gas company's offer in the first two weeks the club rooms were opened. Among the groups who have held meetings here are parent-teachers associations, bridge clubs, welfare workers, book review clubs, and dramatic societies.

A cooking school for Girl Scouts working toward merit badges will be started during January for a six weeks course. Meetings will be held once a week from 3:45 to 5 o'clock, and each girl will have access to a gas range during every class hour.

The kitchen is equipped with gas range, Electrolux, sink with automatic dish-washer, and work tables.

Mason Regulator Co. Buys Neilan Co. Ltd., of Los Angeles

Mason Regulator Co. of Boston, Mass., has purchased the Neilan Co., Ltd., of Los Angeles, Calif. The latter company, founded seven years ago by Tom J. Neilan, manufactures a line of regulators and valves for the gas and oil industries.

Leslie Soule of Boston, on November 1 went to Los Angeles to take charge for the Mason Regulator Co. at Neilan Co., Ltd.

Tom J. Neilan expects to enter the jobbing business in Los Angeles representing Wm. Powell Co., Cincinnati, Ohio; Everlasting Valve Co., New York, N. Y., and McCord Lubricators of Detroit.

Water Heater Manufacturers to Take Part in Industrial Exhibit

Los Angeles manufacturers of water heaters bearing the approval seal of the American Gas Association, have each been invited to display one of their domestic models at the Natural Gas Bureau, 815 East Washington Street. The bureau is a cooperative industrial merchandising interest of the Los Angeles Gas and Electric Corp., the Southern California Gas Co., and Southern Counties Gas Co., all headquartered at Los Angeles.

Wells, Minn. to Be First Town in State to Receive "Natural"

The first city in Minnesota to receive natural gas will probably be Wells, a town of approximately 1,800 population just over the Minnesota-Iowa boundary line, where a franchise was recently granted to the Northern Natural Gas Co. of Omaha, Neb. Supply will come from the Mason City-Owatonna line now under construction.

Franchise Granted at Avoca

Avoca, Iowa, recently granted a 25-year franchise to the Iowa-Nebraska Light and Power Co., subsidiary to Northern Natural Gas Co., Omaha, Neb.

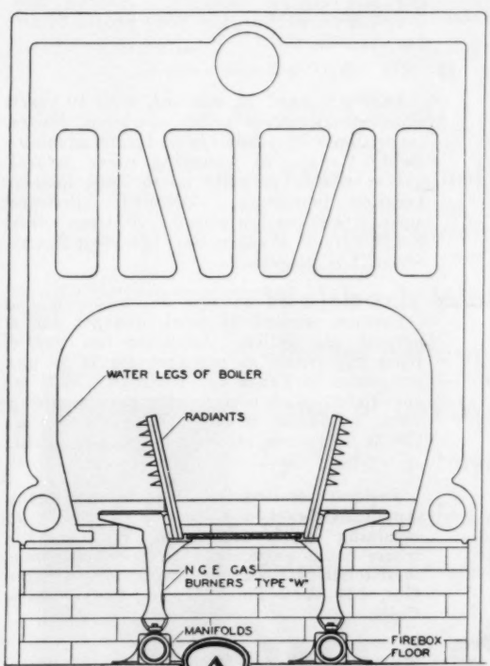
Kansas Pipe Line Serving Barnes

"Natural" was turned on in Barnes, Kan., on November 4 by the Kansas Pipe Line & Gas Co., Salina, Kan.

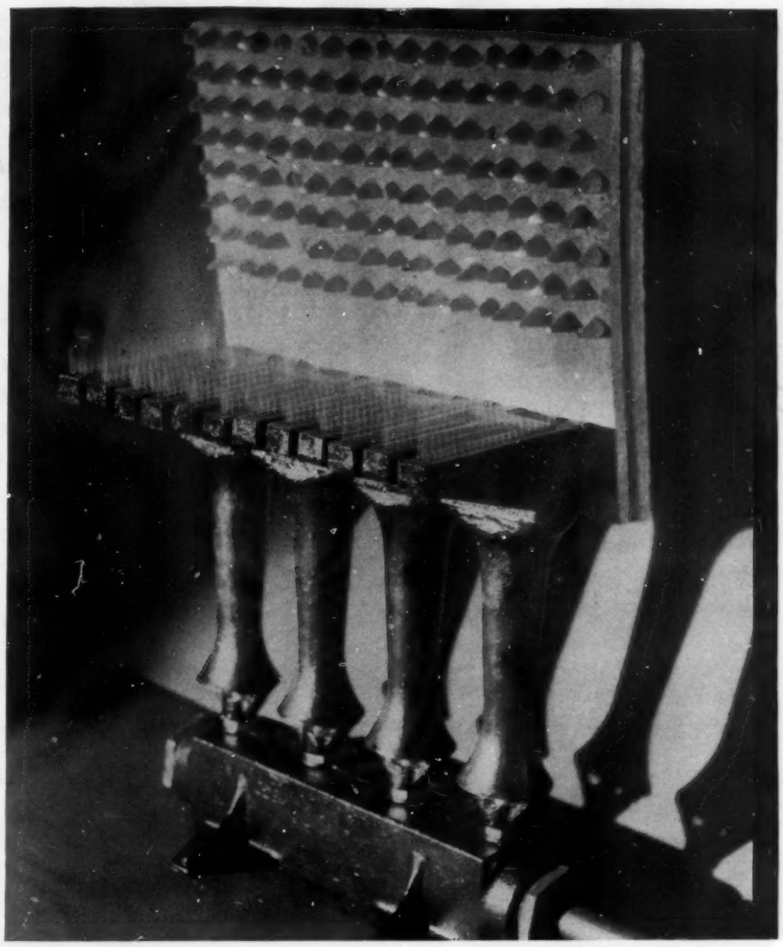
EVEN

an apprentice can install this simple UNIT SYSTEM

Easiest to install
No shop work necessary
Minimum stock required



WILGUS REGULATORS
N. G. E. GAS BURNERS
ANUBIS DIFFERENTIAL PRESSURE RECORDERS



N. G. E. Type "W" GAS BURNERS

FOR LOW PRESSURE BOILERS

The N. G. E. Type W Gas Burner fits any size of low pressure steam boiler. The required capacity of the installation is built up unit by unit from Standard 2-, 3- and 4-burner manifolds right on the job. The burners fitting into the manifold units are all ONE standard size and the radiant plates join together into one compact assembly without cementing.

FEATURES—Flame located at grate level close to water legs. Radiants generate large amount of heat. Flame and hot products confined near primary combustion surfaces. Secondary air brought in only around burners. A positive definite circulation of water in boiler insured. No backfiring. Quiet. No vibration or panting. Uniform combustion. Flame can be turned down very low. Perfect for heating boilers in public buildings and industrial plants. Ask for Catalog.

Look to the Pioneers for Continued Leadership.

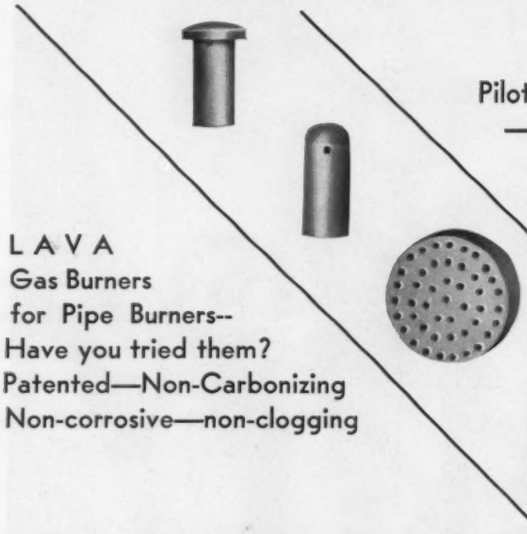
NATURAL GAS EQUIPMENT CO.

LOS ANGELES . . . PETROLEUM SECURITIES BUILDING
SAN FRANCISCO . . . . . 1123 HARRISON STREET

Pacific Coast Distributors for
WEBSTER ENGINEERING CO., TULSA SURFACE COMBUSTION CO., TOLEDO
Montana Distributors—HEATING ASSURANCE, INC.—BUTTE, MONT.

LAVA

THAT NEVER SAW A VOLCANO



Pilot tips and Burner Heads —even complete Burners are being made by us for gas appliance manufacturers. Why not for you?

LAVA
Gas Burners
for Pipe Burners--
Have you tried them?
Patented—Non-Carbonizing
Non-corrosive—non-clogging

AMERICAN LAVA CORPORATION

1413 Williams Street Chattanooga, Tennessee

Manufacturers of Heat Resistant Insulators

For smart living... this exclusive apartment hotel in the heart of the famous Wilshire District, overlooking beautiful Westlake and Lafayette Parks.

Rates on Application

L. C. Reed, Manager

The Arcady

2619 WILSHIRE BLVD.
LOS ANGELES

MUELLER GAS ERA BOILERS

fill the most exacting demands for thoroughly dependable and economical gas-fired steam and hot water heating equipment.

For details, write:

L. J. MUELLER FURNACE CO.,
334 S. 2nd St., Milwaukee, Wis.

Makers of a complete line of gas-fired boilers and pressed steel and cast furnaces

Classified Advertising

Classified advertising five cents per word; minimum $2.00 per insertion. Situation Wanted advertisements up to 50 words will be published three consecutive issues without charge. Small professional cards 1-in. deep by 21 ems wide are $5.00 monthly on 12-time contract.

SITUATIONS WANTED—MALE

Mechanical engineer and draftsman experienced in laying out, drawing plans, and writing construction specifications for gas compressor stations and natural gas absorption plants, also supervision of construction; desires position with company needing qualified man. Applicant's age, 29 years. References and record of experience will be supplied. Available December 1 or before with about one week's notice. Address Box E-161, *Western Gas,* 124 West Fourth St., Los Angeles, Calif.

Mechanical and electrical engineer, age 46, with ability to speak Spanish, seeks position. Applicant is experienced in work with butane gas, having installed and put into operation 15 butane plants on Pacific Coast, and has had 20 years experience in supervising construction and as local manager of gas and electric company. Address Box E-169, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Manager, aged 34, married, with 10 years experience in public utility operation, desires connection with possibility of future advancement. Capable of managing either natural gas or electric property up to 5,000 meters. Location immaterial. Detailed experience and references furnished. Address, Box E-155, care of *Western Gas,* 124 West Fourth Street, Los Angeles.

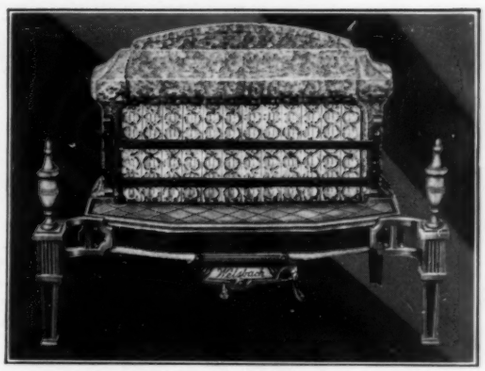
Position wanted as local manager for a natural gas utility. Applicant has had 6 years experience as manager for large gas companies in Texas and Missouri. Will go anywhere. Can also handle merchandising work. Address Box E-157, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Position desired as franchising agent. Applicant has had successful experience in obtaining utility franchises. Will go any where but is particularly interested in southwest territory. Address Box E-159, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Manager of gas company with 10 years experience desires to make connection with larger utility where ability to produce will win advancement. Location immaterial. Detailed experience and references furnished. Address Box E-165, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

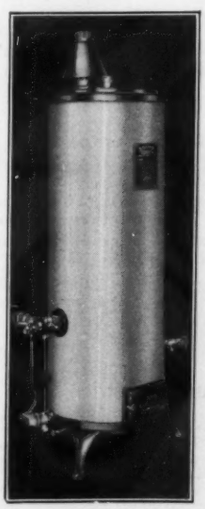
Married man, 19 years experience in construction, operation and maintenance of high-

Time proved value is of Key Importance in these days of Careful Buying



THESE are days of careful buying. Close scrutiny of value is the rule . . . And the name Welsbach, backed by 40 years of earned leadership in the gas appliance field, is recognized by Commercial Managers more fully than ever before as a definite factor in making sales... **Welsbach Radiant Heaters** are outstanding because of their original design and fine finish—yet are moderately priced . . . Welsbach quality is revealed in every detail of their construction.

Welsbach Water Heaters have gained their leadership through their efficient performance (and favorable prices). In fact there is not a single detail of any Welsbach appliance that will not bear close examination by today's buyers. When Welsbach gas appliances are featured, profitable sales are sure to result.



Member of American Gas Association

WELSBACH COMPANY

GLOUCESTER CITY, N. J.

Offices in Principal Cities

50 Hawthorne Street, San Francisco
226 South Wabash Avenue, Chicago, Ill.

Sprague Semi-Chrome Leather

Resists Acids
and Boiling Water

Now Used in All

Sprague Meters and Regulators

May we send you samples and data?

The Sprague Meter Co.

BRIDGEPORT, CONN.

Los Angeles, Calif., San Francisco, Calif.

Newark, Ohio

Davenport, Iowa Houston, Texas

The BARTLETT HAYWARD CO.

Designers and Builders

GAS HOLDERS

COMPLETE COAL GAS, CARBURETTED WATER AND BY-PRODUCT PLANTS

SALT WATER and FRESH WATER CONDENSERS

PURIFIERS, STEEL TANKS, FELD VERTICAL SCRUBBERS

Main Office and Works
Baltimore, Md.

Lincoln Building
New York City

pressure natural gas mains, desires position. Applicant will go anywhere, and will do any kind of work, but prefers maintenance of high pressure line. Can supply good references. Address E-Box 167, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Accountant and auditor, several years practical diversified experience, including service with gas companies, desires position. Applicant is competent to take charge and can prepare financial and other supporting statements, including tax matters. Location immaterial, will work for moderate salary. Can supply references. Address E-Box 163, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Salesmanager, now employed, wishes to make change. Six years experience with natural gas. Understands gas appliance merchandising, installations, conversion jobs, etc. Applicant is 30 years of age and married. Can furnish references. Prefer to locate in Northwest States. Address Box E-171, *Western Gas,* 124 West Fourth Street, Los Angeles, Calif.

Reynolds Gas Regulator Co. Announces New Low Pressure Catalog

The Reynolds Gas Regulator Co., Anderson, Ind., announces that the company's new Low Pressure Catalog is ready for distribution. Although this new book is devoted to low pressure regulators, it gives in the last pages detailed information regarding automatic, quick-closing, anti-vacuum valves for high or low pressure work. The new catalog shows the Reynolds Low Pressure Regulator line and gives information as to its use. It also introduces the new Reynolds Midget and Double Valve Units. The Midget is recommended by the company for installations such as pilot lights, oil burners, etc., especially where the consumption does not exceed 10 to 15 cubic feet per hour. The Midget is built in one pipe size, 1¼-inch, and is furnished in spring type adjustment.

Output of Natural Gas Increases 400 Fold in 10 Years

Since 1920 the output of natural gas in the three largest producing states, Texas, Oklahoma and California, has increased approximately four times, while the number of users has multiplied more than six times, according to the Oklahoma Utilities Association. The production of the three states in 1930 was 1,015,000,000,000 cubic feet as compared with 256,000,000,000 cubic feet in 1920.

Dresser Manufacturing Company Limited, Is New Canadian Corp.

S. R. Dresser Manufacturing Co., Bradford, Pa., announces the formation of Dresser Manufacturing Company, Limited, a Canadian corporation with head offices at 32 Front Street West, Toronto, Ontario, Canada. D. B. McWilliams has been named director in charge of sales for the newly formed company.

Ogden on "Natural" Service

Natural gas has been turned on in Ogden, Iowa, by the Iowa Distributing Co., subsidiary of Missouri Valley Pipe Line Co., Omaha, Neb.

Full Insulated 16-inch Oven

WEDGEWOOD

"Console" CLOSED TOP

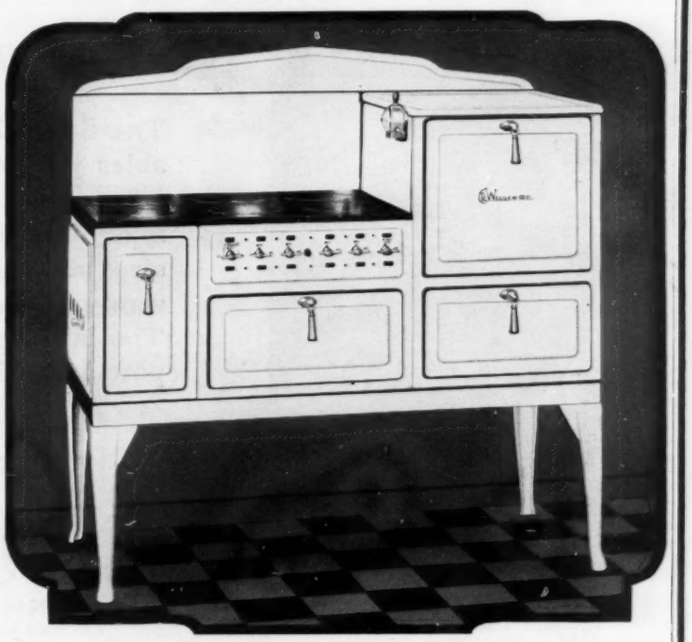
Large Six-Burner Size Cooking Top

Stainless, rust-proof porcelain finish

The finest Wedgewood Gas Range ever made. Never before has a gas range offered so many incomparable features. Every feature that modern stove engineers could devise for beauty and efficiency. New roll-out broiler with drop door permits use with door open. Both top gas burner and gas kindler in extra large kitchen heater. Heavy lids.

JAMES GRAHAM MFG. CO.

Largest Stove Manufacturers in the West
A Pioneer That Is Still the Leader
San Francisco, Newark, Calif., Los Angeles



In the following exquisite finishes—mellow ivory, cool green, or ivory with marbleized panels.

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Automatic heat is here to stay. This winter will put hundreds of the homes in your community on the immediate prospect list for automatic gas conversion heat. You don't have to wait until Spring, however, to make these profits. You want to get them right NOW. You want to close gas heat sales while the prospect is "hot."

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THE BARBER GAS BURNER CO.
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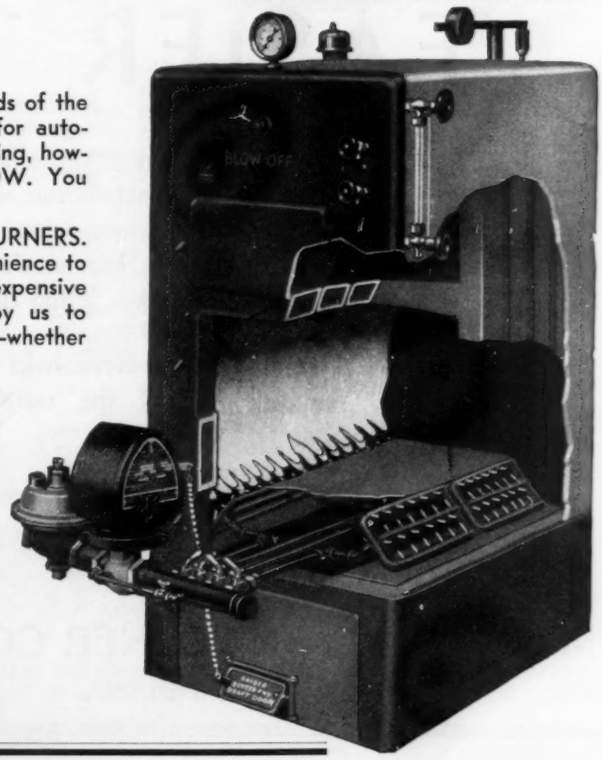
BARBER
Automatic Jet Gas
BURNERS



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Retails for $78.75

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without the use of fittings

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THIS photograph at the left illustrates what we mean by *"bottle-tight deflectability."* There's a gasoline tank underneath this curb pump, and it was preferred not to go to the expense of moving it to make way for this 12" gas pipe line. The Doublex Simplex Joint solved the problem. The joint was first completed, then deflected by driving wooden blocks between the pipe and the trench wall. The resulting angle was so sharp that you cannot see the continuation of the line beyond the pump. Yet the Doublex Simplex Joint took pressure *without leaking.*

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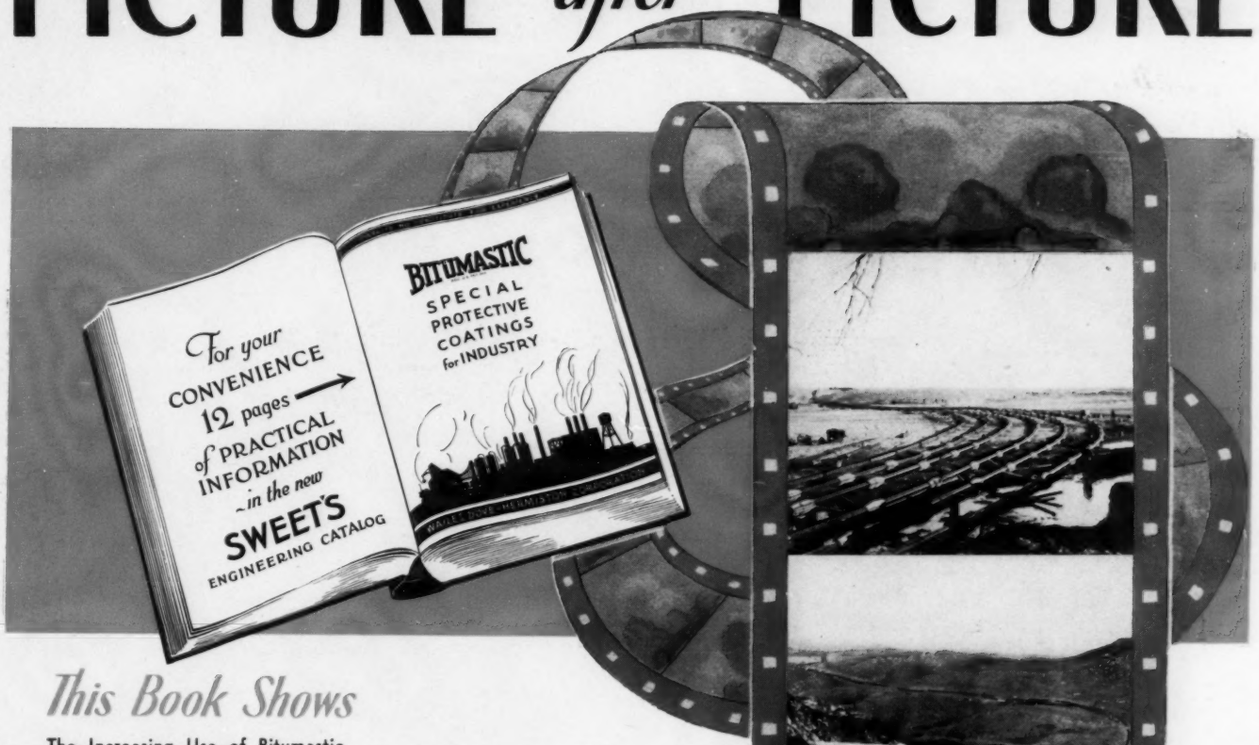

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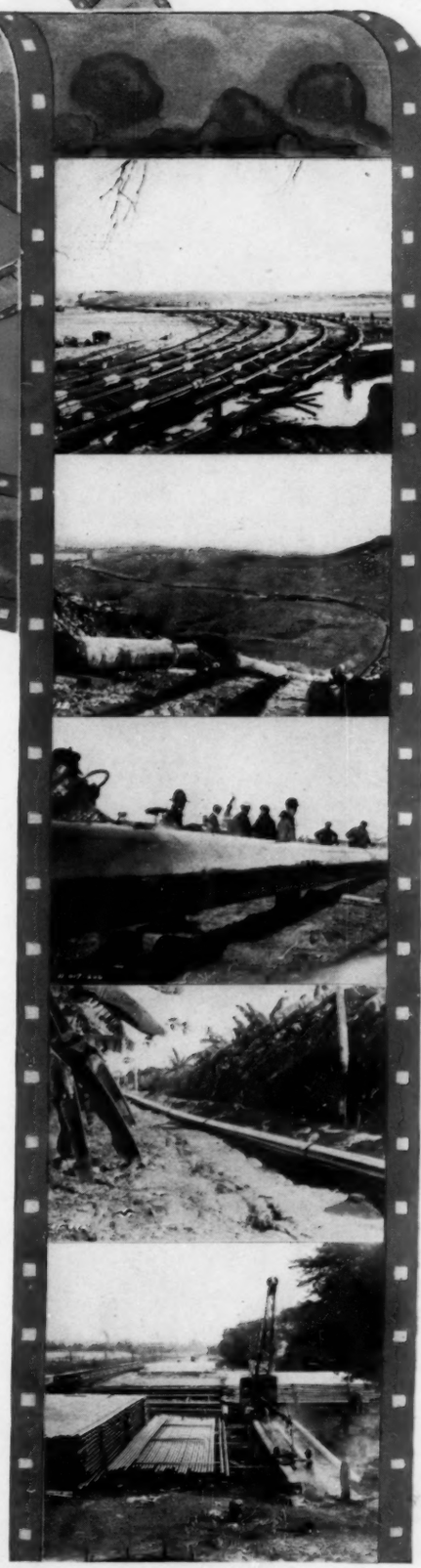

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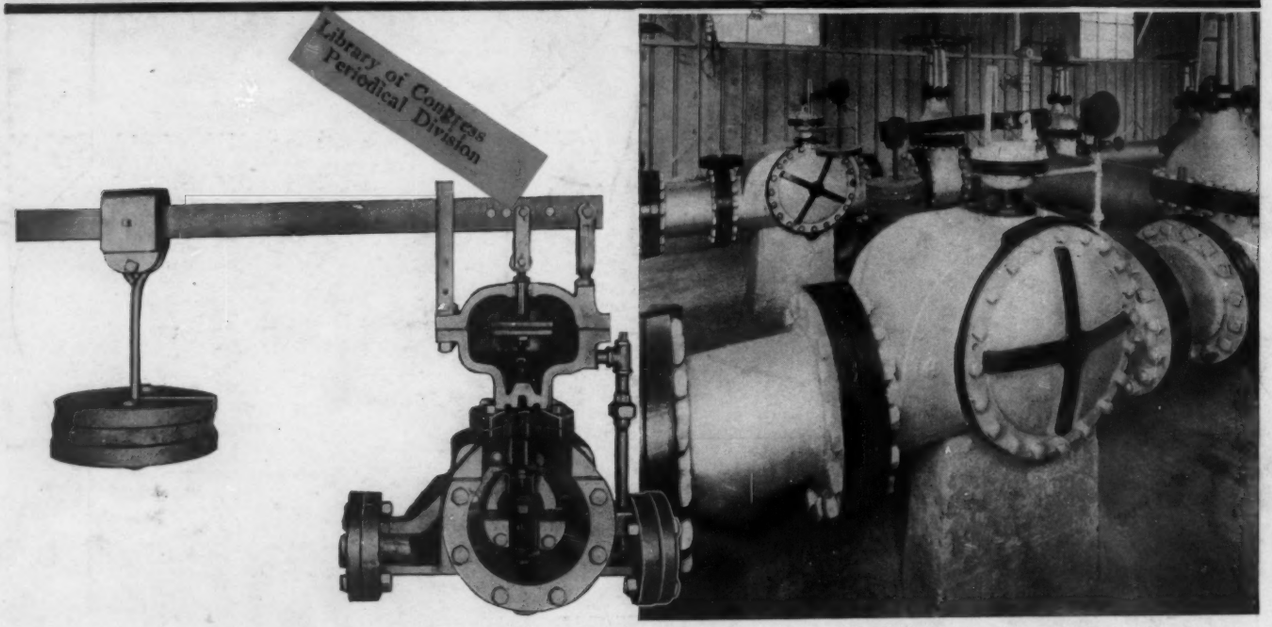

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